We're Stuck With It

AT long last we have the price and wage freeze with us. The air will be rent with arguments from here on out. Cries from some will be high pitched; from others will come anguished yowls. It was that way last time; it will be that way this time.

Those who are opposed to controls will not change their minds. Those who wanted controls will find they are not the whole answer. Those who thought controls should have come long ago will say "I told you so." All will have a part of truth on their side. But none will be satisfied.

The months ahead will be tough on everyone. This country does not take to man-made controls. No man or group of men knows even a part of the answers. Revisions will come time and time again before we have anything approaching a fair setup. Those who brought on controls by their lack of restraint and greediness will be the same ones who will be responsible for the black markets to come.

Those who think that ceilings and controls are the answer to everything are in for trouble. Ceilings came simply because even in a war or defense period voluntary restraint means no more than lip service to many. Even though the majority would and could have gone along with a voluntary plan, there were enough others to wreck and make a mockery of such a setup.

Those who feel the Administration acted too late are right but neither the people nor Congress were ready 6 months ago to agree to controls. Those who want no controls at all have too much faith in formulas and paper economics. They have had little experience with human nature. Even the most conservative industrialists who wanted no controls 6 months ago, long ago privately said we should have them.

Controls will not stop inflation. The best they can do is to slow it up a little. There will be more price increases. There must be, if fair treatment is the standard. We have no Solomon to answer our complex 20th century problems. Wages and salaries will not really be frozen. They too will go up under the guise of correcting inequities and other high sounding phrases.

If we are to prevent an inflationary defeat for us and success for Stalin, we must do far more than put this dynamic economy under controls. We need higher taxes, far more stringent credit curbs, a much heavier savings program for all people, a paying off of private debts, a sharp reduction in non-defense spending and a brutal realization of how close we are coming to losing our liberty because of communism.

We are stuck with controls. Somehow they must be made to work. The stumbling around will be pitiful for a long time. Unless we attack inflation at its roots, reliance on controls alone will wreck us as surely as the commies will.

Tom Campbell

Editor

FROM LAMINATIONS TO REFRIGERATOR DOORS...

BLISS HAS THE RIGHT PRESS FOR THE JOB

A picture tour of Bliss Presses in action at various General Electric Company plants

Whether your metal-stamping production is large or small, requiring automatic or hand-fed presses...mechanical and hydraulic...Bliss has the right press for your job.

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For blanking, forming, drawing or squeezing operations, Bliss engineers are equipped to make unbiased analyses and recommendations for proper methods and equipment. Bliss is the only company that builds the complete range of press equipment required by industry.

Next time you need advice on metal-stamping production, call your Bliss representative. Show him your high-cost stampings. Selecting proper equipment and methods is "everyday" business with Bliss engineers, who are skilled in pressed-metal techniques and equipment. There's a good chance that they can give you the right answer.

E. W. BLISS COMPANY, TOLEDO 7, OHIO

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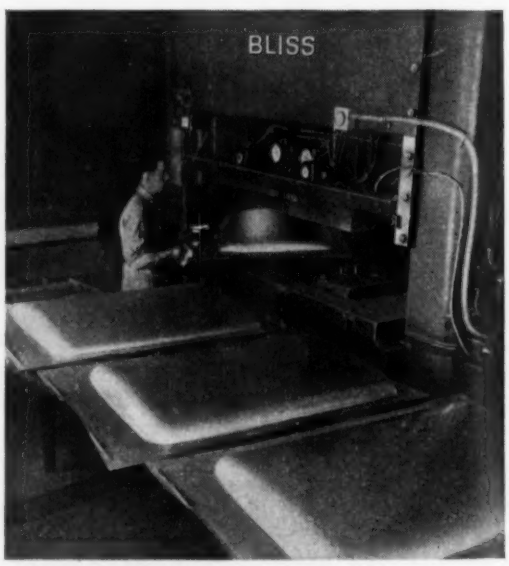

AT ERIE, PENNSYLVANIA: Doors for home refrigerators are drawn in this 350-ton Bliss "E" type straight side press equipped with Bliss-Marquette die cushions.

BLISS BUILT

FROM THE RIGHT PRESS FOR A GIVEN JOB...

IRON AGE *newsfront*

news methods and product forecast

► Look for pig iron to get tighter as steelmaking capacity expands. Melting furnace construction takes less time than blast furnaces; the time lag will cut into merchant iron supplies from some plants.

► A laboratory process has been developed for making hematite ore (Fe_2O_3) magnetic. This will permit magnetic separation of low grade hematite. Until this development came along the magnetic separation of iron from its ore was only possible on magnetic ore (Fe_3O_4).

► Aluminum cartridge cases are being considered for small caliber ammunition. The reduction in weight would be particularly attractive in machine gun and small cannon ammunition for aircraft.

► Acute tinplate shortages are reported in South America, in England and on the Continent. Some foreign canneries have already laid off help because of the shortage but U. S. exports are likely to go down because of restrictions. Though thinner tin coatings will be more widely used, the outlook is for more canning in glass during the present emergency.

► By 1953, the electric generating capacity reserve over peak loads in the U. S. will increase from the current 11.8 pct to a more comfortable 19.9 pct, according to an industry observer known for his accurate estimates.

The only thing that could upset this prediction is a tremendous expansion in aluminum, magnesium and perhaps electric furnace steel. With government and industry pressure strong for boosting metal production, the margin may turn out to be less comfortable than is generally assumed.

► German cars will be assembled in Brazil; Fiat will assemble in Mexico and two English firms, Austin and the Rootes group will build assembly plants in Mexico. U. S. car manufacturers have had Mexican plants for some time but the European influx is significant.

► The British are trying to interest the U. S. in their twin jet flying boat fighter plane built by Saunders-Roe.

► A top-notch research institute is now studying ways of improving the method of adding magnesium to nodular or ductile cast iron. The aim is to overcome the difficulty of accurately controlling the percentage range of residual magnesium introduced into the bath and the efficiency of additions in terms of total recovery.

Gaseous magnesium and magnesium compounds of low volatility are being tried.

► Contrary to some generally held opinions, porcelain enamel will not crack or chip from steel until the yield point of the steel has been reached or exceeded. It fails only after a certain amount of strain, which has no relation to the strength of the metal.

► Tentative specifications for iron powder rotating bands on 90-mm and 105-mm shells have been developed. Efforts made during World War II to interest the Army in these bands were fruitless although the Germans made wide use of them. The principal gain would be to take some pressure off critically short copper.

"I wasn't asleep," said the Dormouse

EVERY boy and girl knows the drowsy Dormouse of Alice in Wonderland. He was elbowed and pinched by the Mad Hatter and the March Hare as he mumbled in his sleep at the tea party.

But our young people aren't so well versed in everyday economics. They have a sadly distorted picture of the profits of business. They don't realize why profits are necessary, how small they are, or how they are divided.

For instance, in a recent survey of high school seniors, it was discovered that they believe over 50% of the sales dollar is profit and they think stockholders receive 24% of it. Actually business profit averages less than 8%, with less than 3% distributed as dividends. Business uses most of its profit, moderate as it is, for new plant and equipment, to improve products and to make more jobs.

Misconceptions among our youth bode ill for America's future. They open the door for too ready acceptance of dangerous isms and false foreign philosophies. Such misunderstanding of economics can be corrected only with facts supplied by business itself. You as a leader in your community must share this responsibility.

The American business man must not allow himself to be cast in the role of the Dormouse, pinched and pilloried by the March Hares of communism and the Mad Hatters of the "everything for nothing" state.

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IRON AGE *summary*

iron and steel industry trends

Capacity of 120 Million Tons Seen by '52
Eastern Capacity Second Only to Pittsburgh
Shell Steel Orders Lifted from DO List

THE greatest steel expansion in history will reach a climax about the end of 1952 when annual ingot capacity will exceed 120 million net tons. This new total results from a study of capacity expansion by companies and plants just completed by THE IRON AGE. Some programs listed are still under consideration; some that have been announced are likely to be on the conservative side.

When the last rivet is driven home the industry's competitive map will be largely redrawn. The Pittsburgh-Youngstown district will retain the No. 1 spot with capacity of more than 43.6 million ingot tons. The East will replace Chicago in the runner-up position with 28 million tons, compared with close to 24 million tons. Cleveland-Detroit capacity will be 13.3 million tons; the West 6.4 million, and the South 5.6 million. This totals 120.7 million tons, an increase of 21.4 million over capacity at Jan. 1, 1950.

Three Factors Promote Expansion

This tremendous expansion has been spurred by three factors: (1) Opportunity of amortizing part of the cost over 5 years for tax purposes; (2) the defense effort, and (3) encouraging results from market studies of the long range demand for steel.

Complaints about the wage-price freeze are frequent and loud. Early this week there were indications that some of the frozen area would be thawed. Price roll-backs were expected momentarily on some items. Indications were that in the future this order would act as a flexible restraint, rather than a deep-freeze.

Confusion still reigns in the steel market. Producers still lack any concrete knowledge of what is expected of them, except that it is plenty. As a result they are not able to give their customers any definite idea as to what they may expect. Pressure for more certain knowledge grows.

There are indications that the present priority system of placing defense orders in steel mills is starting to collapse under its own weight. Hot-rolled bars of projectile or shell quality steel have been lifted out of the DO category entirely. They are now subject to direct negotiation with NPA. This change also applies to shell quality billets, and rolled armor plate.

Government Directives Change Plans

Steel producers are finding it more and more difficult to maintain production schedules. The reason is that no production schedule is ever final. Just when they think they are all set a new government directive forces them to change their plans. The freight car program is interfering with the DO's, the oil country goods program is interfering with the freight car program, etc. Program requirements have reached the saturation point as far as some companies are concerned.

The steel picture would quickly become a lot clearer if the Military could make known its definite needs in terms of numbers of guns, tanks, ships, and planes. Until they do this the confusion will become worse. Such concrete clarification is believed to be at least 30 to 60 days away.

Some Progress to Clarification

However, some progress is finally being made towards this goal. The Military are now working out some arms requirements schedules. When this job is finished the needs can then be converted and scheduled by tons of steel required.

Steelmaking operations this week are scheduled at 101.5 pct of rated capacity, up half a point from the previous week. If equaled, this rate will yield another new all-time record for steel melted in a single week. The previous record was established last week.

(nonferrous summary, p. 170)

Nine welds for 14 cents!

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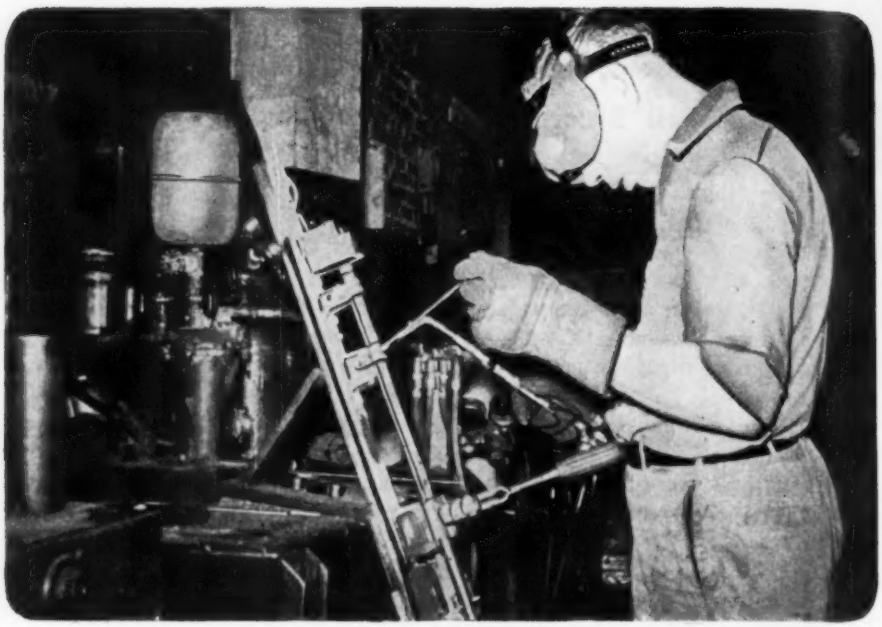

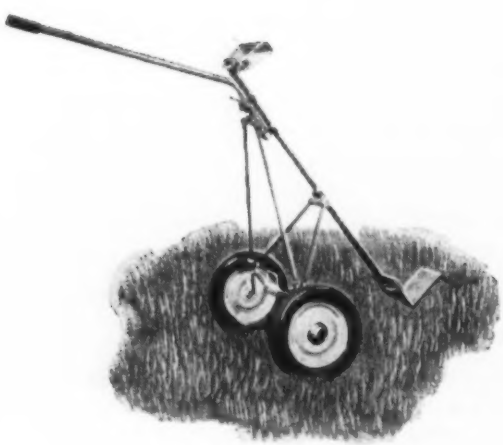

That's all it costs for labor to braze-weld the nine joints required for assembly of this smart tubular steel Collapsible Golf Bag Cart. It's a product of the Lake Manufacturing Co. of Lansing, Michigan and, to make the welds, they used ANACONDA "997" (Low Fuming) Welding Rod supplied by our distributor, Purity Cylinder Gases Inc., Grand Rapids.

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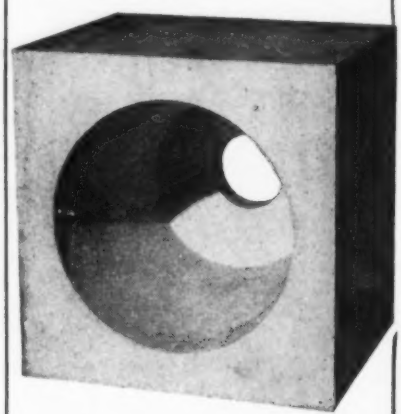

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Philadelphia 37, Pennsylvania

Dear

Letters From Readers

Where To Spend It?

Sir:

I have not seen anything in your paper recently regarding Portsmouth Steel Co., Portsmouth, Ohio. They sold their plants about a year ago and have in their treasury about $12 million, which belongs to the stockholders.

Although they are still paying dividends, I have not heard of them doing any business since closing. The question is, what are they going to do with this money?

M. E. JOHNSON
West Long Branch, N. J.

This money has not been reinvested. As far as we are able to determine, it is still the intention of the controlling interests to reinvest their money at some later date, and they are still seeking a suitable investment.—Ed.

Readers' Opinions Solicited

Sir:

We have a client who is anxious to know if the sizing of black hot-rolled steel bars, some of which are up to 0.010 in. out of round, can be done economically in a draw bench in the as-rolled condition. It is desired to avoid the operation of pickling, as the product is not required to have bright finish. The presence of scale imbedded in the product is not objected to.

The amount of reduction would be about 0.010 to 0.015 in. on bars ⅜ to ¾ in. in diam. Material 28/32 and 25/40 tensile mild steel. Some of your readers may be able to give their experience on cold drawing under these conditions, indicating the life to be expected from tungsten carbide or other dies, speed of drawing, power required, lubricants, and so forth.

J. J. QUINN
Managing Director
Metal Products (Cork) Ltd.
Cork, Ireland

Unpickled bars are not customarily cold-drawn in this country. The scale would be too detrimental to the life of tungsten carbide dies. In fact, it would probably be cheaper to pickle than to redress or replace the dies.

With the small amount of reduction required, it might be possible to draw the material in the unpickled condition with cheaper dies. The best solution might be to run the bars through a roll straightening machine. These machines are capable of reducing the bars the specified amount and would also serve as a very fine scale breaker, except that the bars will show imperfections of scale marks. Perhaps our readers have some other ideas.—Ed.

Possible Solution

Sir:

Your article on extruding axle spindles, p. 108, June 15, 1950, was of great interest to us. Mr. Chase mentioned a swabbing compound of 60 pct machine oil, 25 pct Brooks compound and 15 pct Ceylon plumbago. Would you be good enough to give us further information as to this Brooks compound, as it may help us with some of our difficulties with dies.

W. R. McKAY
H. V. McKay Massey Harris Ltd.
Sunshine, Australia

The compound is made by the Brooks Oil Co., 934 Ridge Ave., Pittsburgh 12, Pa. More complete information may be obtained by writing directly to them.—Ed.

On Inspection Standards

Sir:

Your Dec. 14, 1950 issue carries an item pertaining to new uniform inspection standards. You state that Sec. XIV is a new regulation just issued by the Defense Dept. Since we now have several contracts and subcontracts we would like to know where and how this Sec. XIV can be obtained.

O. C. OLSEN
Mgr. Quality Control
Vendo Co.
Kansas City

Copies of Sec. XIV of the Armed Services Procurement Regulation may be obtained from the Munitions Board, Washington, D. C.—Ed.

Good Prediction

Sir:

I have not finished looking through your Jan. 4th issue but I have just reread your editorial "What's Ahead" and I want to congratulate you on the cleancut, hardhitting presentation of the facts of life facing us this year. I particularly like your last sentence and I hope we do put up because if we don't I think we may *be* shut up. It's a good job, and it's an eye-opener, too.

G. VAN ALSTYNE
Advertising Mgr.
Air Reduction Sales Co.
New York

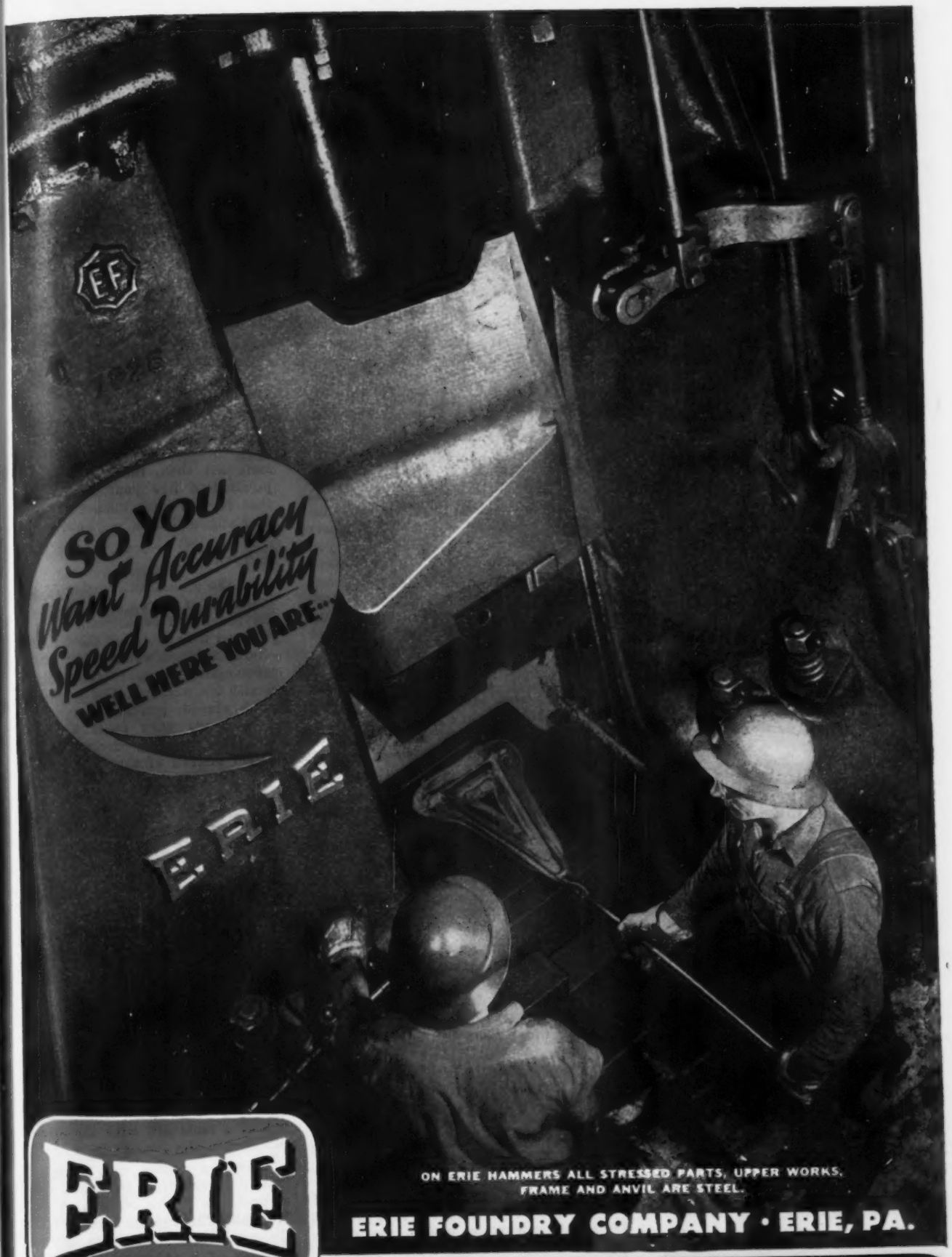
Capital "C" See?

Sir:

We have noted with interest the article "Lathe Tools Used in Milling Cutter" on p. 103 of your Dec. 14, 1950, issue, and appreciate your reference to our product. However, may we ask that in future references to the word "Carboloy" a capital "C" be used? "Carboloy" is our registered trademark and its use with a lower case "c" tends to jeopardize our trademark interests.

E. C. HOWELL
Merchandising Mgr.
Carboloy Co., Inc.
Detroit

Of course Carboloy is a well-known trademark, and we apologize for the typographical error.—Ed.



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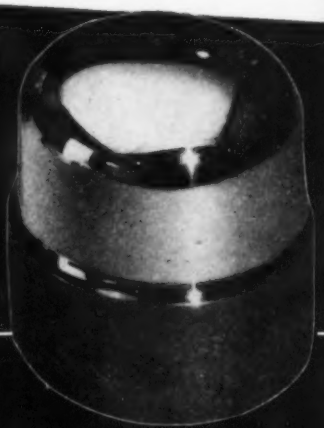

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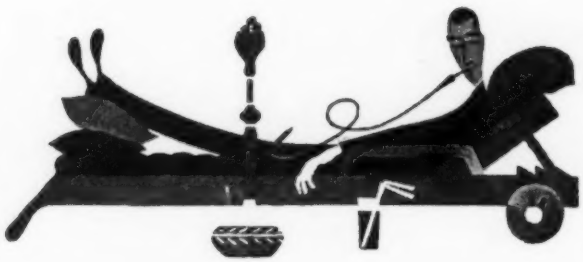

Fatigue Cracks

by Charles T. Post

Veto

Let this stand as a warning to guard carefully copies of your favorite family journal and report immediately to the F.B.I. if you see any suspicious characters snooping around them. At this moment you hold in your hand information which Soviet foreign agents undoubtedly have been instructed to get at all costs.

We weren't going to say much about it, but since the national news services, *Time*, and a few assorted gossip columns have whispered across the country that your f.f.j. has stopped sending copies to Russia and friends at the request of the U. S. State Dept., you'll be relieved to know it's true. As a result, Fort Knox will receive nearly $10,000 less Russian gold this year, since the Soviets, like other eastern hemisphere subscribers, have been paying $25 per annual subscription . . . and cheerfully.

As recently as last fall, State's attitude, as we understood it, was that your f.f.j.'s depiction of the American industrial machine in action was effective propaganda behind the Iron Curtain. But times have changed, and apparently Moscow has become a little cozy with some of its technical magazines, so State asked if we would kindly cut off the Eastern European copies. It could be, too, that someone remembered your f.f.j.'s innocent little piece correctly appraising what was going on at Oak Ridge, Tenn., almost a year before that mushroom cloud rose over New Mexico. The censor caught that one, at the last minute and the same censor may not be working there any more.

So far as we know, no other publication has received a similar request from Dean Acheson's men, but then, there is no other publication like your f.f.j. None that carries such hush-hush data as Fatigue Cracks, anyhow.

Fishbowl

At the annual convention of the Institute of Scrap Iron & Steel, the promotion department filled a fishbowl with pieces of sheet scrap, offered a fancy wrist watch to the scrap man who could estimate most closely the number. The scrap experts stared, pondered, scratched their heads, then came up with estimates ranging from 200 to 90,000 instead of the actual 1653. The biggest sucker, of course, was your f.f.j., which paid $8.53 for about 15 lb of scrap, or about $1137 a ton.

Puzzlers

After the flood of letters on the trick circle problem we were a little disappointed to see so few answers to the ball problem in the Jan. 18 issue. Could it be that the rearmament program is taking up too much of our readers' time. War is hell! For those who tried it the answers are 47.618 fps, 19.357 ft and 27.481 fps.

H. M. Barnes, Chrysler Corp., is the latest to remind us that we were trying to make a mountain out of a mole hill with the circle problem in the Jan. 11 issue.

Here is a puzzler that is just a little different from the usual run of problems in this column. A. M. Woodall, The Ingalls Iron Works Co., poses this one. A 24 in. sphere consists of a spherical steel core with a specific gravity of 7.84 and a uniformly thick cork cover of 0.24 specific gravity. What is the thickness of the cork cover if the composite sphere has a specific gravity of unity?

machine tool high spots

sales inquiries and production

by W.A.Lloyd

April—Priority Date?—Despite a growing clamor for machine tools for the defense program, it appeared this week that April, or thereabouts, is a likely date for the release of the emergency production schedules and the priority for materials that is expected to accompany them.

It was reliably reported that NPA's machinery division has sent out tentative copies of the emergency production schedules to machine tool builders for verification—or a check on what types and sizes of machine tools are being ordered and what is in production.

Return by 60 Days—Informed observers assume that it will require about 60 days to get these reports back to Washington, make a breakdown on them, write the orders and get clearance for release. In all, a matter of probably 60 days.

Aircraft Shop Orders—Machine tool builders may receive purchase orders for machine tools for the maintenance shops of Boeing Aircraft Co. and Pratt & Whitney Div. of United Aircraft Corp., rated DO-97, it was reported this week.

Authority has been given by the Munitions Board to the Secretary of the Air Force for Boeing Aircraft Co. and to the secretary of the Navy for Pratt & Whitney Div. of United Aircraft Corp. to apply DO-97 on the purchase orders of these two companies for the purchase of maintenance, repair and operating equipment or supplies needed to repair breakdowns or prevent imminent stoppage or slowdown of production in these plants. It is not contemplated now that DO-97 will have wider application.

Warn NPA of Cutbacks—In Washington, spokesmen for the Electrical Motor Manufacturers and the Industrial Control Manufacturers Industry advisory committee warned of possible output cutbacks due to difficulties in obtaining copper and aluminum for defense orders at a joint meeting with NPA officials. NPA said they would help on an individual company basis to fill DO orders and provide equipment to expand basic industries as a means of conserving copper and aluminum.

ORDERS AND SHIPMENTS

	New Orders	Foreign	Shipments
1949			
Dec.	82.5	22.4	75.7
1950			
Jan.	99.7	26.7	52.8
Feb.	89.2	18.8	56.1
Mar.	107.4	24.9	75.3
Apr.	98.9	17.4	61.6
May	116.4	18.4	82.5
June	124.1	23.0	91.9
July	253.1	22.3	68.3
Aug.	305.1	34.2	95.7
Sept.	280.6	27.2	101.6
Oct.	289.6	49.5	100.9
Nov.	291.9	26.6	110.9
Dec.	410.1*	112.8*	135.7*

* Preliminary figures.
Average shipments 1945-47 = 100 pct.

NPA Machinery Div.—Marshall M. Smith, former president of E. W. Bliss Co., was named director of NPA's machinery division. He has the responsibility of building up an organization to develop NPA programs for the machinery industry and evaluating defense needs for capital equipment, including industrial machinery of all types.

NPA also appointed two assistants in the machinery division, Herbert L. Tigges, Baker Brothers, Inc., Toledo, Ohio, as adviser and consultant on metalworking machinery problems, and P. L. Houser, International Harvester Co., Chicago, as acting chief of the machine tool section.

Reorganization — In Los Angeles, the Machinery Manufacturing Co., former builders of the Vernon line of jig borers, millers, shapers and tool and cutter grinders, announced a reorganization under a new name, Diversified Metal Products Co. A development program is in progress for precision machine tools which are in current demand.

FREE *publications*

These publications describe money-saving equipment and services . . . they are free with no obligation . . . just fill in and mail the postcard on the opposite page.

Welding Accessories

The Weldit torch stand, safety check tank connection, and 2-way propane utility manifold are described in a new bulletin showing how these accessories provide more convenient and economical operation. The 2-way manifold makes a propane network more versatile, and can be attached to the safety check tank connection which automatically shuts off the flow of gas if the hose becomes ruptured or disconnected when the tank valve is open. The torch stand has a 360° radius so that the torch may be turned in any direction. The Weldit plumbers' melting furnace, for high efficiency at low cost, is also described. *Weldit, Inc.*

For free copy insert No. 1 on postcard.

Broach Care Chart

A timely and useful new 3-color poster chart for wall or bulletin board mounting is offered free to users of broaches and broaching machines. The chart is designed for in-plant use to increase broach life, improve their service performance and help lower the cost of maintaining broaches. Entitled "Broaches Help Pay Your Wages—Take Care of Them!" it lists the ten basic "Never and "Always" of broach care, intended to aid in realizing big dividends in broach savings. *Colonial Broach Co.*

For free copy insert No. 2 on postcard.

Serrated Blade Reamers

P & W Camlock serrated blade reamers, available in either high-speed steel or carbide tipped types, are described in a new 8-p. catalog telling how these adjustable blade reamers deliver high production and accurate finish in tough reaming operations. Sizes and prices for the full line of shell and chucking reamers are listed along with information on arbors, blade dimensions and data on component parts. *Pratt & Whitney Div., Niles-Bement-Pond Co.*

For free copy insert No. 3 on postcard.

Solving Pump Problems

Rotary pumps have been considered by many as too technical for the average industrial man to buy or sell without the aid of an extra pump technician. The cloak of mystery is pulled away in a new 32-p. booklet that explains in simple language the different steps to follow in selecting the proper pump. Data tables that will aid not only the beginner but also the experienced pump engineer are furnished. Other useful information on installing rotary pumps, locating trouble, pump care and how to order parts is also presented. *Geo. D. Roper Corp.*

For free copy insert No. 4 on postcard.

Motive Power Batteries

"Ironclad Batteries for Motive Power Service," is a new catalog describing the performance and utility of storage batteries for users of materials handling and haulage vehicles. The catalog consists of an information booklet and 5 data pages, the latter listing specifications of Exide Ironclad batteries, accessories and miscellaneous parts. This new catalog was designed for purchasing departments and for key personnel connected with the specification and purchase of motive power batteries. The information booklet lists user benefits for these batteries, illustrated by high power availability and uniform speed charts. *Electric Storage Battery Co.*

For free copy insert No. 5 on postcard.

Carbide Tools Booklet

All data in former Carboloy tool catalogs and supplements, in addition to information on many items not previously carried in stock, are presented in a new 60-p. catalog that not only lists tools and other items, but also tells how to select and apply them. Differences and limitations in the various grades of carbide are clarified, covering both the tool and wear-resistant grades. The catalog is divided into sections with a pictorial index, making it easy to use and a handy reference for the shop man, purchasing agent and design engineer. *Carboloy Co., Inc.*

For free copy insert No. 6 on postcard.

Reducing Valves

A new 6-p. bulletin containing complete technical information on Golden-Anderson's cushioned water pressure reducing valve also features the general arrangement of the G-A reducing pilot valve, with a detailed list of parts. Installation, operation, adjustment, servicing and specifications are fully described, along with tables showing general dimensions, approximate shipping weights and general list of materials. *Golden-Anderson Valve Specialty Co.*

For free copy insert No. 7 on postcard.

Motors and Generators

The new Life-Line type SK dc motors and generators are described in a new 19-p. booklet containing a transvision sequence showing construction details. It shows how the new design uses rolled steel frames, heavy steel brackets, steel angle feet and prelubricated double-sealed ball bearings to provide added strength and long life without outages. The

Turn to Page 154

NEW *production ideas*

new and improved production ideas, equipment, services and methods described here offer production economies . . . fill in and mail postcard.

Universal Joints

Ball type, designed for light duty applications, available in 4 sizes.

A new ball-type joint has steel forks bearing upon a bronze ball, with heat-treated centerless ground pivot bearing pins. The large pin is equipped with the Curtis patented oiler for proper lubrication of all bearing points. Ball surface offers minimum of friction loss, insuring long life for light load transmission or for hand operated controls. All sizes are furnished with riveted small pin. Sizes are ½, ¾, 1 and 1¼ in., single or double, solid or bored hubs. *Curtis Universal Joint Co., Inc.*

For more data insert No. 18 on postcard.

Improved Boring Tool

Provides accuracy to 0.0002-in. and speeds production operations.

Improvements in the E-Z set boring tools include increased tool rigidity through incorporation of larger dove-tail areas, ground fit male and female dove-tail, micrometer-like adjustment to facilitate accuracy, and elimination of distorting slots or gibs. The change from steep angle threads on the scroll mechanism to modified square type threads reduces back-lash to a minimum and augments tool rigidity and accuracy. E-Z Set boring tools cover boring range from ⅜ to 20 in. *Maxwell Co.*

For more data insert No. 19 on postcard.

Crucible Tongs

For safe handling of sample crucibles.

Jumbo crucible tongs are 21 in. long and made of 18-8 stainless steel. Positive control is assured by a patented handle that provides separate grips for the thumb and one finger. *Fisher Scientific Co.*

For more data insert No. 20 on postcard.

Table Way Lubricant

A slightly tacky, non-corrosive way lubricant for machine tools.

Febis K-53 has been developed as a special way lubricant for machine tools. It is slightly tacky, non-corrosive, mild EP lubricant that passes the Cincinnati Milling Machine Co.'s Stick-Slip Test of having a coefficient of static friction lower than its coefficient of kinetic friction. It also has high resistance to washing from metal surfaces and has mild rust preventive characteristics. *Esso Standard Oil Co.*

For more data insert No. 21 on postcard.

Hot-Topping Compound

Saves steel by cutting 2 in. from poured height of hot-tops.

Subjected to rigid tests before used in production, Mexatop, a new hot-topping compound has enabled one steel company to cut the poured height of hot-tops by 2 in. and reduce the metal in the hot-top by 1.5 pct on maximum weight ingots. Records are said to show a saving of 3000 to 4000 lb per heat. Mexatop gives a U-shaped cavity in the hot-top rather than the V-shape. The compound weighs 48 lb per cu ft and can be applied,

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production ideas

Continued

it is said, for 3¢ per ingot ton. It is equally effective on casting risers. *U. S. Graphite Co.*

For more data insert No. 22 on postcard.

Fan Nozzles

Improved line produces more uniform coverage with less waste of spray.

Spray patterns have been made heavier in the center than at the edges of the new fan nozzles; side jets containing coarse droplets have been eliminated. There is less overspraying due to doubling up of the sprays from adjacent nozzles resulting in combined uniform covering. F Series nozzles include 13 disks made of stainless steel with flow rates of 1/10 to 10 gpm and spray angles of 50° to 90°. Disks are interchangeable in a brass base and cap assembly, having a ¼-in. male pipe connection. *Bete Fog Nozzles, Inc.*

For more data insert No. 23 on postcard.

Heat-Resistant Belt

Conveys hot materials to 600°F.

Called Super-Insulated Sahara, a new heat-resistant belting that conveys and elevates hot materials is made of heavy silver duck combined with asbestos and special insulating materials. It has proved successful in handling various hot materials, including red hot castings and foundry shake-out sand. *Imperial Belting Co.*

For more data insert No. 24 on postcard.

Air Vibrators

Long or standard stroke piston; operate on 80 psi line pressure.

Series 79 air vibrators are available in eight standard sizes for use on hoppers, tables, molding machines, chutes and other production equipment. For hopper installations, the vibrators can be used in conjunction with a Spo quick-acting hopper-gate-valve, that actuates the vibrator only when the hopper discharge gate is open. Vibrators are available in 2 and 2½-in. piston diam with long or standard stroke. Bodies are cast from semi-steel. Models are tapped for ¼-in. rigid or swivel type, straight or L connector for hose attachment. *Spo, Inc.*

For more data insert No. 25 on postcard.

Wire Drawing Compound

Magicoat is designed for drawing wire without any acid cleaning.

The new coating forms a dark, glossy oxide, with good lubricity. It is reported to have shown fine results on annealed stainless steel rod and wire, high carbon rod and wire, and low carbon wire and tests have proven that rod and wire coated with Magicoat are impervious to rust. The compound is used in hot solution, requiring only a coating tank as equipment. *Magnus Chemical Co.*

For more data insert No. 26 on postcard.

Milling Cutters

Feature truncated triangular blade.

Very close blade spacing is afforded in the new line of heavy duty milling cutters without loss of body or blade strength, it is claimed. A wedge type lock permits locking and unlocking the blade within a quarter to a half turn of an Allen wrench. The locking unit is self-contained and the wedge is actuated to and fro without the use of hammers or drifts. Each blade is backed up with a heavy, fine pitched screw that allows infinite adjustment throughout the life of the blade. Blades of Series 70 Tri-Bit face mills are high speed steel, super high speed steel, cast alloy, and carbide tipped. *Weddell Tools, Inc.*

For more data insert No. 27 on postcard.

Strain Analyzer

Electronic instrument for study of vibration, strain, dynamic stresses.

Known as the H-42A Strainalyzer, a self-contained electronic instrument records phenomena up to 50 kc and amplifies these weak signals up to 35,000 times. It makes possible the simultaneous observation and recording of four separate traces on a single 5-in. oscilloscope tube, each appearing in correct time relationship without the necessity of optical alignment. All four traces appear si-

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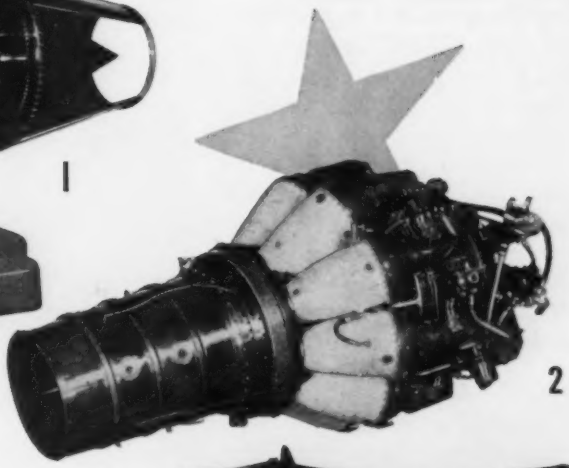
RINGS THAT GO IN A STRAIGHT LINE

1



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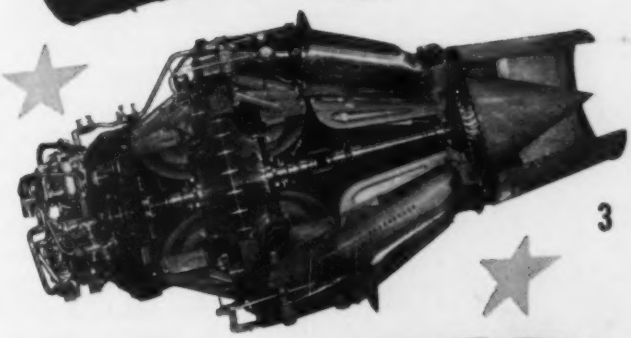

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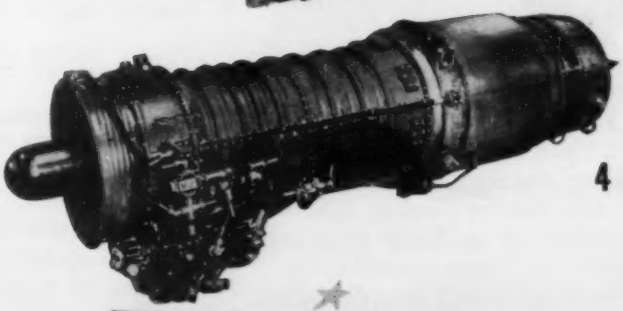

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production ideas

Continued

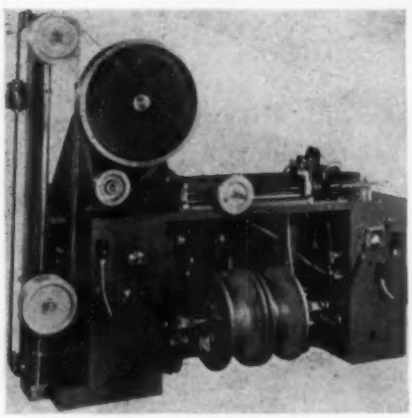
multaneously on a 5-in. screen for absolutely correct time and phase relationship. Recording is accomplished with a Fairchild Oscillo-Record camera. *Electronic Tube Corp.*

For more data insert No. 28 on postcard, p. 37.

Constant Tension Takeup

Dual-reel, continuous extrusion takeup has speed of 0 to 2600 fpm.

Built with integral capstan and tension stand, a new high-speed, constant-tension, dual-reel, continuous extrusion takeup for wire and cable features a speed range of 0 to 2600 fpm, with instantaneous acceleration of the empty reel to synchronous wire speed as soon as crossover is made. No interruption or slow down in the winding process is necessary to shift from



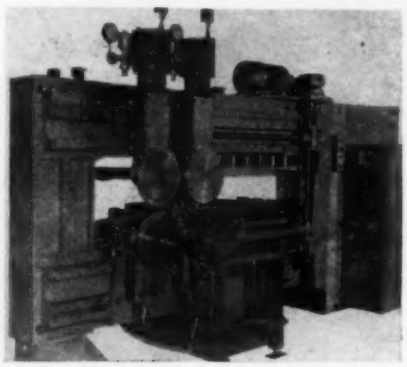
full to empty reel. Drives for reels, capstan and traverse are hydraulic and self-contained with fully enclosed, oil-immersed gears. Reel mounting features a demountable shaft and bearing housing assembly carried by a heavy bearing mounting on a lever-operated, tilting base, permitting loaded reels to be deposited gently on the floor upon the reel flanges. The unit is available complete, without the capstan, or with separate, floor mounted capstan and tension stand. *Industrial Ovens, Inc.*

For more data insert No. 29 on postcard, p. 37.

Mash Welder

Welds flat sheets of pickled mild steel to maximum 28 in. in width.

Mash welding is a resistance welding technique employing a seam or projection type welder to obtain a clean smooth end-to-end joint without metal overlap or protruding metal on the joined edges of the sheets. The joint is suitable for many purposes without further grinding or other finishing. The PMM2TL press type mash welding machine has been built for a specific application of joining a 28-in. wide mild steel sheet to form a continuous line for various mill operations. It incorporates the Sciaky three-phase system and is equipped with a locating and



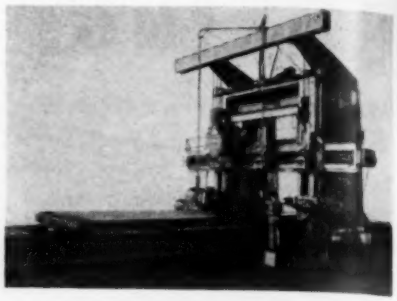
clamping table to automatically locate the sheets to a proper overlap and hold them securely for the welding operation. Two steel idling wheels perform a rolling operation that reduces the overlap of the two sheets to a minimum thickness. Thickness can also be controlled by varying the amount of pressure provided by the upper head assembly. *Sciaky Bros. Inc.*

For more data, insert No. 30 on postcard, p. 37.

Planer-Miller

New Hypro machine performs multiple operations on huge parts.

With three planing heads and two milling heads, a new Hypro combination planer and miller will handle work up to 10½ ft wide, 9 ft high and 26 ft long. Right and left hand planer heads mounted on the rail may be operated individually or simultaneously. A right hand planer side head gives the machine conventional planer advantages. Rail heads may be traversed to clear the entire table for vertical milling head, also mounted on the rail. The head swivels to reach angular surfaces on the part being machined. A left hand milling side head augments the regular machine functions and swivels to reach the side of workpieces. Other features include non-metallic table ways having forced lubrication; complete herringbone gear table



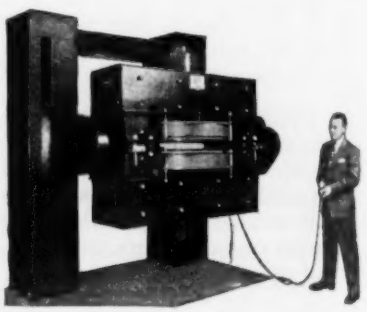
drive; dual rail control; and separate pendant control for planer and milling operations. *Giddings & Lewis Machine Tool Co.*

For more data insert No. 31 on postcard, p. 37.

Betatron

X-rays 20 in. of steel in 10 min.

The Allis-Chalmers 22 million volt Betatron is the newest tool for production radiography of large heavy metal castings. X-rays from the Betatron will penetrate 20 in. of steel in 10 min (4 in. of steel in a matter of seconds). Because of its wide latitude (up to 6 in.) fewer radiographs need to be taken and no time consuming



blocking materials are used. Detail is reportedly so excellent that a 1/32-in. crack is revealed in steel sections ranging from 2 to 12 in. in thickness. A 1/16-in. crack can easily be seen in steel sections 20 in. thick. *Picker X-Ray Corp.*

For more data insert No. 32 on postcard, p. 37.

Hot-Cold Test Stand

For testing small aircraft parts; temperatures —70° to +230°.

The test stand has a deep well that accommodates parts measuring up to 6x6x8 in. The item to be tested is placed in the well and

Turn to Page 157

Wire shapes shown are greatly enlarged.

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Your product, too, may have one or more parts which could be made better and more economically from Continental's shaped wire. Or, you may be able to add extra sales appeal with decorative Continental wire for smarter, lower-cost trim. Most manufacturers today are looking for ways to reduce product costs while improving the competitive appeal of things they make and sell. At Continental you will find engineers who are ready and eager to work with you to solve your "shape-engineering" problems. If you want service with the wire you buy, call on Continental. Wire or write us at Kokomo, Indiana.

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IRON AGE *introduces*

C. H. Wills, appointed director of sales for the MICHIGAN ABRASIVE CO., Detroit. **B. S. Meade** joined the firm in the capacity of general sales manager.

Edwin R. Bartlett, elected chairman of the board of directors of the HOOKER ELECTROCHEMICAL CO., Niagara Falls, N. Y. Also, **R. Lindley Murray** was promoted to the office of president of the company.

H. R. Cameron, appointed assistant chief engineer of the PITTSBURGH BRIDGE & IRON WORKS, Pittsburgh.

J. W. Bryant, named comptroller of RESERVE MINING CO., St. Louis County, Minn.

Thomas O. McMillan, appointed eastern district representative for the WARNER ELECTRIC BRAKE & CLUTCH CO., Lebanon, Pa.

W. P. L'Hommedieu, appointed assistant Pacific Coast district manager for the WESTINGHOUSE ELECTRIC CORP., San Francisco. **Bruce D. Henderson,** appointed general purchasing agent, with offices located in Pittsburgh. **Wesley H. Lees,** appointed general traffic manager for the company.

Domenic A. DiTirro, named to head up the sales and technical service engineering Divisions of the ROSS OPERATING VALVE CO., Detroit.

H. R. Shapaugh, appointed district manager of sales, southern branch, for the FRUEHAUF TRAILER CO., Dallas. Other district sales managers appointed: **V. H. Rossman,** Philadelphia; **F. L. Brower,** Birmingham; **M. J. MacQuarrie,** Buffalo; **C. L. Sargent,** Boston; **M. M. Williamson,** Oklahoma City, Okla.; **A. V. Howe,** So. Kearny, N. J.; **Glen W. Buse,** St. Paul, Minn.

Carl G. Holschuh, promoted to vice-president and assistant general manager for manufacture, of the SPERRY GYROSCOPE CO., Great Neck, N. Y. **Edward U. Da Parma,** becomes vice-president and works manager.

Richard E. Coe, elected assistant to the president of the ELECTRIC FURNACE CO., Salem, Ohio.

Charles H. Wagner, elected as a vice-president and director of the GEROTOR MAY CORP., Baltimore.

Ben Kaul, appointed to the new position of technical development engineer for the MULLINS MFG. CO., Salem and Warren, Ohio. Other promotions: **Michael Theil,** becomes superintendent of tools and dies. **Ralph Bradley** becomes general superintendent of engineering, tool design and estimating, and **Andrew W. Arnold,** promoted to superintendent of the Warren plant tool department.

Gilbert Soler, resigned as vice-president, manufacturing operations and director of ATLAS STEEL LTD., Welland, Ontario.

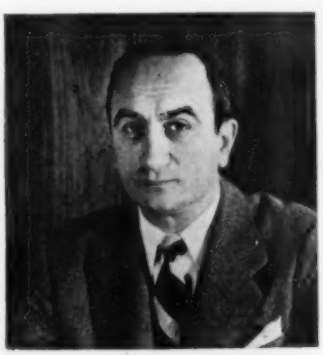
Carl J. Tsaloff, named manager of the Cadillac, Mich., plant of the B. F. GOODRICH CO. Mr. Tsaloff succeeds **Felix G. Tanner,** who has retired.

Steve Girard, appointed assistant general manager of KAISER-FRAZER CORP., Willow Run, Mich.

John J. Murphy, appointed in charge of the Washington, D. C., office, government contracts department, of the HUDSON MOTOR CAR CO.

Gerald J. Lynch, formerly assistant director of the office of defense products, has been named director of the Washington, D. C., office for the FORD MOTOR CO.

C. M. HOUCK, elected president of the Pittsburgh Testing Laboratory, Pittsburgh.



DAVID WHITE, appointed president of the Lester Engineering Co., Cleveland.

L. PIERCE RICHIE, elected vice-president in charge of purchases for the Oliver Corp., Chicago.

IRON AGE

salutes

John G. Munson

IN retiring as raw materials vice-president of U. S. Steel (he will continue to serve in an advisory capacity), John G. Munson must feel enormous satisfaction from a job well done. Few men of industry have ever faced sterner assignments; fewer still have achieved such shining success.

Mr. Munson became raw materials officer in 1939—just in time to tackle the tremendous job of supplying U. S. Steel and others with record quantities of materials needed to make steel for guns, tanks and ships of World War II. Production records tell how well he met the challenge.

But his toughest job was still to come. The war chewed up a lot of precious resources, including ore. The great Mesabi was being depleted at an alarming rate. And far-sighted steel people saw iron ore trouble ahead.

That was when Ben Fairless gave John Munson the unenyiable assignment of solving the ore problem. He picked the right man. Mr. Munson knows how to make haste without fanfare or noise. Though retiring in nature, he is a brilliant raw materials man, as well as a keen judge of others.

These talents were to prove invaluable in organizing the most detailed search for ore ever conducted. He picked his men carefully, gave them wide latitude, then backed them to the hilt on every question that came up.

At the same time the great search for ore was going on in Venezuela, Mr. Munson was pressing development of methods for beneficiating Minnesota taconite ores. The rest of the story is well known. Fabulous Cerro Bolivar was discovered in Venezuela, and a million-ton capacity ore treating plant was built at Virginia, Minn., future site of large scale taconite beneficiation.

Because John Munson had faith, imagination and plenty of hard-won experience in the raw materials field, he finally won out—U. S. Steel has enough ore for 100 years, and it isn't all in one basket.

ROY F. HANCOCK, appointed assistant to the vice-president in charge of sales for the Vanadium Corp. of America, New York.

NEAL J. CRAIN, appointed director of purchases for the United Engineering & Foundry Co., Pittsburgh.

HAROLD G. INGERSOLL, elected as a vice-president of Borg-Warner Corp., Chicago.

FRANK J. THOMPSON, appointed director of purchases of the L. J. Mueller Furnace Co., Milwaukee.

IRON AGE *introduces*

Continued

P. F. Lindeman, promoted to vice-president in charge of operations and **M. J. Russo,** advanced to the position of vice-president in charge of purchasing of the PACIFIC CAN CO., San Francisco.

Carlton H. Rose, named manager of the Washington, D. C. office of NATIONAL LEAD CO.

C. B. Kershner, appointed purchasing agent for the BIRDSBORO STEEL FOUNDRY & MACHINE CO., Birdsboro, Pa.

Edwin E. McConnell and **Lewis S. Greenleaf, Jr.,** elected members of the board of directors of the NORTON CO., Worcester. **Thomas S. Green,** retired from the board after a service of 13 years.

Robert Pollock, appointed district sales manager, New York, of the Wire Rope Divisions of AMERICAN CHAIN & CABLE CO., INC.

Arthur T. Baum, Jr., appointed director of personnel of the HYDRAULIC EQUIPMENT CO., Cleveland.

Edwin S. Ladley, named assistant director of purchases of HERCULES POWDER CO., Wilmington, Del.

Robert T. Haslam, elected to the board of directors of WORTHINGTON PUMP & MACHINERY CORP., Harrison, N. J.

Victor F. Stine, elected vice-president in charge of sales and engineering, and a director of the PANGBORN CORP., Hagerstown, Md. **Lloyd L. Stouffer,** becomes secretary and treasurer and a director of the company.

T. W. Krueger, appointed as assistant general sales manager of the DUFF-NORTON MFG. CO., Pittsburgh.

John V. Freeman, retired as director of the coal chemical sales division, commercial department, U. S. STEEL CO., Pittsburgh. **Charles W. Baldwin,** succeeds Mr. Freeman, and **John W. Clinton** becomes Mr. Baldwin's assistant. By retiring, Mr. Freeman ends 43 years of service with the company. **Robert McC. Maxwell,** appointed general product manager of the coal chemical sales division, commercial department.

Joseph J. Lusch, appointed manager of orders and schedules, a newly created department of BETHLEHEM PACIFIC COAST STEEL CORP., San Francisco.

W. E. Miles, elected vice-president in charge of crawler tractor and industrial sales for the OLIVER CORP., Chicago.

Delmar Woodhouse, elected secretary of KROPP FORGE CO., Chicago. Mr. Woodhouse will continue as comptroller of the company.

Robert J. Wagner, appointed industrial relations manager for the HARBISON-WALKER REFRACTORIES CO., Pittsburgh.

D. A. Coyle, named plant manager for the BUDD CO., Charlevoix plant, Detroit. **W. H. Montee,** succeeds Mr. Coyle as works manager of Charlevoix plant.

Robert E. Novy, elected a director of INLAND STEEL CONTAINER CO., Chicago. **Edward E. Grosscup,** promoted as manager of the Chicago plant; **Thomas M. Dyer,** transferred to New Orleans as manager, southern plant; **Norman D. Rice,** moved to Chicago as chief engineer in charge of engineering, research and development.

OBITUARIES

E. H. Weitzel, 82, retired vice-president and general manager of the Colorado Fuel & Iron Co., died in Los Angeles recently.

John F. Hennessy, manager of sales, Chicago district, Bethlehem Steel Co., for the past 22 years, died recently after a brief illness.

Albert A. Breault, Albany representative for Brace-Meuller-Huntly, Inc., for the past 17 years, died recently.

E. Arthur Kerschbaumer, 45, chairman of U. S. Ferro-Manganese Co., New Mexico, died suddenly on January 20, 1951.

Harry Hanson, vice-president and secretary of the Griffin Wheel Co., died suddenly in Chicago recently, after 48 years of service with the company.

Moses H. Moss, Cleveland district manager for Reliance Steel Div., Detroit Steel Corp., died recently.

Streamlining a Pension Pattern

TO FIT YOUR BUSINESS

THE success of your pension plan will depend upon a streamlining job which gears your pension system with *your* particular financial, personnel and industrial problems. And, if your pension plan is not streamlined to fit your company's circumstances, you may suffer serious loss in dollars and greatly reduce the effectiveness of your plan.

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automotive news and opinions

Plating is major auto problem . . . New cuts will hit hard soon . . . Reuther seeks UMW mutual insurance company.

by Walter G. Patton

Vanishing Bright Work—It now seems certain that the bright work on cars will begin to disappear rapidly after Mar. 1 if not before. A recent Washington order prohibits use of nickel for all decorative parts after that date. Nickel may be used for bumpers, bumper brackets and door handles — if you can get the nickel. However, auto firms have been getting not more than 65 pct maximum of their use during the first 6 months of 1950. Many firms have been getting only 45 pct of their base quota recently.

Painted Bumpers? — At least one car maker has been shipping service bumpers in the unplated condition. Several car producers are experimenting seriously with painted bumpers. Wide chrome trim strips along the side of the car are being painted. Painted bumpers seem to be the most practical solution found up to the present time. However, many engineers see plenty of service trouble ahead if painted bumpers are finally adopted.

Ships Less Copper—Part of the present confusion in the auto industry stems from an increasingly alarming copper situation. Deliveries of domestic copper are running as much as 2 months behind. Reports also indicate deliveries of copper from Chile have sagged badly. One explanation is that copper is being diverted in large quantities into so-called "deformed wire bars" that can be sold more profitably in other parts of the world than in U. S.

Standing Room Only—Cutbacks in automobile production will automatically lengthen the line of buyers which is forming. Cadillac reports 82,000 buyers standing in line. If Cadillac output is reduced 20 pct during the rest of '51, the resultant backlog represents about a year's output.

Lines of buyers for other cars are not as long as Cadillac, but the anticipated reduction of 20 to 30 pct in auto output in the first quarter will lengthen them appreciably.

Reuther's Insurance Plan — Walter Reuther, president of the UAW-CIO, will recommend to his members that the United Automobile Workers set up their own insurance company.

He says insurance companies are making sizable profits out of the worker's insurance dollars. He wants the group to handle its own insurance "on a mutual, non-profit basis." Reuther's program for 1951 for the U.A.W. is: (1) Increased pensions toward a goal of $200 a month minimum; (2) a guaranteed annual wage. Reuther also wants a labor-industry wage commission to study ways and means of achieving a guaranteed annual wage.

New Pontiac Plant — A new sheet metal plant and a drive-out and shipping building have been announced by Pontiac. Construction is to be completed by midsummer. The drive-out and shipping building will handle 750 cars per day. Steel from the present drive-out building will be used in the new 303,000 sq ft structure.

The new sheet metal plant will extend 600 ft along Highwood Ave., adjacent to the present plating plant. This plant will be connected by an inclosed conveyer bridge which will carry fabricated sheet metal directly to the assembly lines, the plating plant, painting operations or storage.

Skirmishes with Unions — The aftermath of price freezing is always unpredictable. An example is the growing unrest in Detroit auto plants, traceable indirectly to the auto pricing order. Attempts by car manufacturers to hold down costs by boosting output in the face of regulated prices have resulted in considerable friction. Kaiser-Frazer, Briggs and others have had recent brushes with the union.

Not all of the labor strife here is directly attributable to the pricing situation. Detroit still has strikes resulting from attempts to

assembly line

Continued

discipline auto workers who are obviously guilty of breaking plant rules. Increased pressure to get out production plus the fear engendered by threatened layoffs have together created an uneasy labor situation.

New **Vinyl Plastic**—B. F. Goodrich Chemical Co. has introduced a new rigid, vinyl plastic said to be superior to available vinyls in the electrical insulation and structural fields. Indicated usage of "Geon 404" includes primary insulation on weatherproof line wire, military aircraft wire, military field wire, jackets on coaxial cable and similar applications.

Available in rigid sheets, rods and tubing, the material can be fabricated into such things as tanks for corrosives and acids, fume hoods and ducts and display paneling. The material is virtually unaffected by water, grease, air, salts, alkalies and acids and is non-inflammable.

Ford Hardtop Sedan — Ford is the latest car producer to introduce a hardtop sedan with the snappy styling of a convertible. The new Ford Victoria has a double drop frame with box-section side rails. Special flanges in the middle of the frame are built in to provide greater body strength. The new model was put in limited production this week.

Tanks' Steel Needs — If and when tank production reaches the 35,000 per year rate, a big tonnage of steel will be required. Estimated requirements for a medium tank is 41 tons. The new Chrysler heavy tank will require substantially more than this.

Modern Handling Pays — Basis for the current interest in materials handling in auto plants is this: A trailer handling loose material moved 20,000 lb of freight in a 48-hr period. In the same time, 93,320 lb of palletized freight were transported. To put it another way, revenue from the truck was roughly four times as great where modern hauling methods are employed. One motor car manufacturer estimates a saving of $75 per car from improved materials handling methods adopted since World War II ended.

K-F in Plane Work — Early in April Kaiser-Frazer will start fabrication and assembly of components of the Lockheed P2V Navy Anti-Submarine Patrol Bomber. A building with 10 acres of floor space has been leased at Oakland, Calif. Equipment is already moving in. Other necessary facilities are on order.

This is the seventh large firm joining Lockheed's group of subcontractors who will build major sections of the F-94 Jet Fighter or the P2V Bomber. K-F will manufacture a portion of the fuselage after the trailing edge of the P2V's wing. The P2V will carry armament and electronic gear to detect submarines.

New Metal Container — Harnischfeger Corp. of Milwaukee is proposing a shipping container (made of steel or aluminum) which is 40 ft long, 8 ft wide and 8 ft high. Containers are loaded on flat cars for long hauls. They can be transferred by crane to flat truck trailers for final delivery. A Chicago cotton goods concern is using two such steel containers carrying 20,000 lb of cotton each.

Chrysler Jet Plant — The new Chrysler jet engine plant will be located within 17 miles of the Detroit City Hall. Exact location has not been disclosed.

Pratt and Whitney Aircraft Div. of United Aircraft Corp. is negotiating a license with Chrysler for production of its J-48 Turbo-Wasp jet engine. The engine delivers 15,000 hp at maximum aircraft performance. It is now in production in Pratt and Whitney's plant at East Hartford, Conn. The Chrysler contract with the Navy Department involves an outlay of $50 million.

Bombers—Ford Motor Co. will add some 220,000 sq. ft. to its automatic transmission plant at Cincinnati to produce aircraft engine lubrication pumps for Pratt and Whitney B-36 bomber engines.

Estimates are Ford will be producing bomber engines in 15 months.

THE BULL OF THE WOODS — **By J. R. Williams**

DRAWINGS... BLUEPRINTS... THEY'RE MADE TO SHOW YOU WHAT TO DO AT A GLANCE, BUT MOST EVERY-BODY STUDIES AN' PORES OVER 'EM!
YES, THEY TELL YOU WHAT TO DO, BUT SOME OF US CAN'T KEEP OUR NOSE OUTA OTHER PEOPLE'S BUSINESS!
HE'S RIGHT-- THEY TELL WHUT OTHER GUYS ARE TO DO, TOO--AN' WE JUST CAN'T RESIST THAT PART OF 'EM!
2-2
J.R.WILLIAMS
THE BLUE FIELDS
COPR. 1951 BY NEA SERVICE, INC. T. M. REG. U. S. PAT. OFF.

M. & M. DUPLEX MILLING AND CENTERING MACHINE
Part — automotive pinion
Operation — mill both ends and center drill
Production — 220 pieces per hour at 100%

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Combine Operations

ON MOTCH & MERRYWEATHER SPECIAL MACHINES

The Motch & Merryweather milling head features rigidity at the tool point.

You can be sure of getting higher production with lower cost per piece by using Motch & Merryweather machines designed for multiple operations. The machine pictured here mills and center drills a vast range of parts, some of which are shown in white above. Our representative will help you obtain thorough-going accuracy, together with *production, PRODUCTION,* and *MORE PRODUCTION.* Contact us *now.*

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Builders of Circular Sawing Equipment, Production Milling, Automatic and Special Machines

PRODUCTION-WITH-ACCURACY MACHINES AND EQUIPMENT

west coast progress report

digest of far west industrial activity

by R.T.Reinhardt

Good News—Best news foundries and primary steel producers heard last week was that Kaiser Steel Corp. had applied for a certificate of necessity involving approximately $55 million for the construction of a third blast furnace, coke ovens and blooming mill at Fontana, Calif. Foundries need the pig and many believe further expansion of primary steel production in the West is limited by availability of metallics.

Metalworking plants are complaining of a lack of government contracts or sub-contracts which would assure them of a steady supply of materials and are hard pressed to keep going with limited steel available.

This situation is believed especially acute in the West where many machine shops and other metalworking plants are small and not fully equipped to handle the few large sub-contracts offered.

Potential Nickel Source—Interest again is revived in the low grade nickel deposits in Douglas County, Ore.

According to S. W. Libbey, director of Oregon State Dept. of Geology and Metal Industries, the M. A. Hanna Co., Cleveland, Ohio, has an option on mineral rights of this deposit of some 20 million tons of ore. It is reported the deposit contains approximately 75 pct chromium oxide, 1.5 pct nickel, and some iron.

Two recovery methods may be used. One involves a wet process by which the nickel can be leached out, producing chromic oxide as a by-product. Mr. Libbey believes the ore contains enough iron and chromite to combine with the nickel into a stainless steel under proper smelting conditions.

Steel Essential in Tests—Boeing Airplane Co. of Seattle, Wash., reports that in tests conducted at its Wichita plant on the B-47 Stratojet approximately 700,000 lb of structural steel in fabricating jigs and scaffolding was used.

These tests subjected the wings to structural stresses greater than would normally be encountered in years of combat flying. In one phase, wing tips were bent through an arc of more than 20 ft—as much as 14 ft upward and 6 ft downward.

K-F to Make Aircraft Parts—Kaiser-Frazer Corp. has signed a contract with Lockheed Aircraft Corp. for fabrication and assembly of components for the Lockheed P2V Navy anti-submarine patrol bomber in San Leandro, Calif. K-F has leased the plant of Osborne Machinery Co.

William A. Cannon, formerly with Lockheed, will manage the K-F Oakland aircraft division and reports production work will start within 60 days. K-F is the seventh large firm to undertake subcontracts for Lockheed and will build fuselage waist sections and center section flaps.

Metals Big Business — During the past 5 years $130,700,000 new capital has been invested in Utah manufacturing plants, according to a survey by the University of Utah. The 5-year investment is more than the total value of the state's manufacturing plants in 1940.

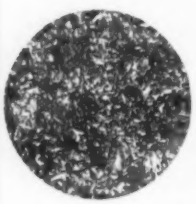
Much of the investment is in primary metals and steel fabricating industries. The survey shows a total of $48 million for foundries in the Salt Lake and Ogden areas, facilities at Geneva steel plant and constructing a new copper refinery. An additional $14 million has been invested in steel fabricating plants in the area.

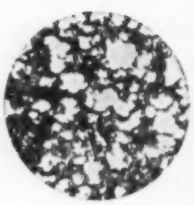
Chrysler Expansion — Chrysler Corp. is planning a $5 million plant at San Leandro, Calif., which company officials describe as a body-building unit for the Dodge division. However, there has been some conjecture that it may be utilized for production of war materials.

flamatic hardening gives a lift to piston rod performan

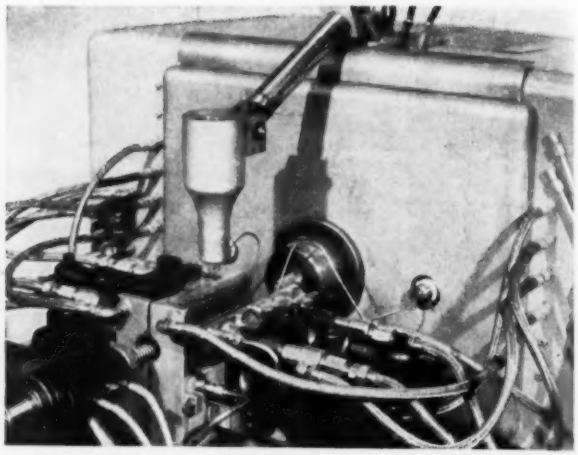
specified

length: 14"
O.D.: 1¼"
material: SAE 1050
structure at surface: Rc 53-55





structure at transition zone: Rc 42



Close-up of hydraulic piston rod being Flamatic hardened, showing work centering device and special flame heads.

achieved

Flamatic selective surface hardening with electronic temperature control goes to great lengths to improve product performance, speed processing, and "shorten" costs as well. This slender 14" long hydraulic piston rod—formerly carburized—is now Flamatic hardened to Rc 53-55 in a matter of seconds . . . on a production line basis . . . and with distortion so slight that corrective operations are a thing of the past. Core and shaft ends are left soft.

A centering device and special flame head assembly readily adapts the standard Cincinnati No. 2 Flamatic to the job. Operat (automatic except for loading) is as straightforward and reliable as on gears, cams, etc., up to 18" OD and spindles up to 24" long.

Examine your present surface hardening processes in the light of a wide variety of Flamatic applications. Twelve interesting fully documented case histories are featured in the new 20-page Flamatic Catalog, Publication No. M-1724. Write for it, on your letterhead please.

flamatic

THE CINCINNATI MILLING MACHINE C

Cincinnati 9, Ohio, U. S. A. •

CINCINNATI

the federal view

this week in washington

by Eugene J. Hardy

Move Toward CMP—Out of all the talk about a Controlled Materials Plan for basic metals finally comes the first concrete step in this direction. The NPA Program Bureau has developed basic instructions and forms for use by the various claimant agencies, including the military, so as to standardize the presentation of requirements for steel, copper, aluminum, etc.

Seemingly a minor step, it is the first move toward the development of a firm claimant program system. Obviously, CMP could not work unless all requirements are presented in the same form.

Spec Index Coming — For the first time in military procurement a standardized index of specifications and standards used by the armed services—Army, Navy, and Air Force—will soon be available. It's a five-volume job being prepared by the Munitions Board and will be available around Apr. 1.

It is designed for use by industry as well as government agencies. The index will not carry the complete standards and specifications, but will clearly identify them and provide information as to where copies may be obtained. Up to now, about 3600 uniform specs have been adopted and 2400 additional proposed uniform specs are in process.

NSRB Powers Gone — Defense Production Administration has taken over NSRB's job of issuing certificates of necessity for fast writeoff of plant expansion and also the issuing of certificates authorizing RFC loans. This was the first official action taken by newly-confirmed DPA Administrator W. H. Harrison.

Various agencies which previously issued certificates will continue to make recommendations on loans. Dept. of Commerce will make recommendations on loans for steel, chemical and other industrial expansion; and the Dept. of Interior will take similar action on loans for petroleum and mining activities. These agencies will make similar recommendations regarding certificates of necessity.

New Materials Study Group—NSRB's only remaining function is planning for mobilization that has already happened and is moving full steam ahead. Its long-range materials planning has been superseded by the President's appointment of a 5-man Materials Policy Commission, headed by William S. Paley, Columbia Broadcasting System.

The Commission will study the long-range requirements and supply outlook; the prospect and estimated extent of shortages; and the consistency and adequacy of the policies, plans and programs of both industry and Government. The Commission is expected to report on the prospect of balancing requirements and supply, including the outlook for allies of this country, within the next 6 to 9 months.

RFC Overhaul — Government loans for defense production will continue to grow in volume at the Reconstruction Finance Corp., despite congressional pressure for a top-to-bottom housecleaning of the giant lending agency.

In the Senate, the Banking and Currency Committee has thrown its weight behind two reorganization plans sponsored by Senator Fulbright, D., Ark. Mr. Fulbright proposes to substitute a single governor for the present 5-man board of directors, and to impose far-reaching limitations on the manner in which loans are granted and administered.

Name Douglas—Appointment of James Douglas as acting deputy administrator of the Defense Minerals Administration has been announced by Secretary of Interior Chapman. Mr. Douglas will assist DMA Administrator Boyd.

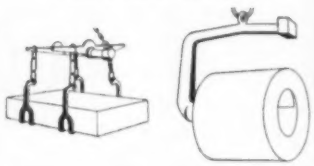
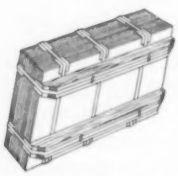
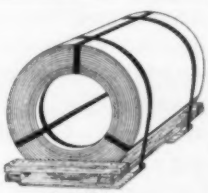
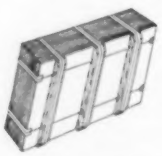
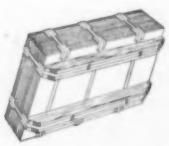
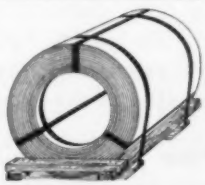
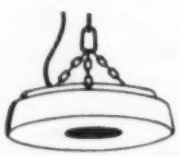
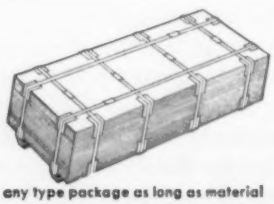
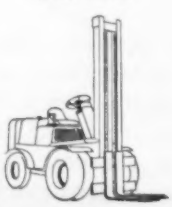
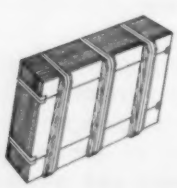
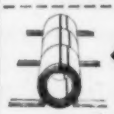
Amend Request—The railroads have amended their petition for an immediate 6 pct freight increase to include a similar increase in charges for handling iron ore at upper Lake Ports. The original petition had not included any increase in these charges.

INLAND DATA for STEEL USERS

INLAND STEEL CO.
38 S. Dearborn Street, Chicago 3, Illinois

Packaging your Steel sheets and strip

One way the steel user may be able to reduce the cost of steel delivered to his fabricating equipment, is by specifying the correct type of package the mill should provide. In the final analysis, his handling equipment, storage facilities, method of transportation from mill to plant and end-use of the steel will all have a bearing on the type and weight of package he needs. The following chart illustrates the most generally used types of packages for steel sheets and strip. We are always glad to recommend to the user, the most suitable type of package for the steels we ship.

Type of handling equipment in steel user's plant	The most generally used types of steel mill packages	
	for cut lengths	for coils
Overhead crane with SHEET LIFTER or COIL HOOK 	 sheets on lengthwise skids	cylinder method of loading coils  coil on skid, core horizontal
Overhead crane with CHAIN OR CABLE SLINGS	 sheets on crosswise skids  sheets on lengthwise skids	cylinder method of loading coils  coil on skid, core horizontal
Overhead crane with ELECTRO-MAGNET 	 any type package as long as material is securely banded or tied	flat method of loading coils coil on platform, core vertical
FORK TRUCK 	 sheets on crosswise skids	Ram truck or Fork truck used as ram  cylinder method of loading coil on skid, core horizontal — Fork truck coil on platform, core vertical

Sheet material with integral stiffening ribs and other structural details is under investigation by the aircraft industry, intent on lowering production costs. Among the methods of producing such structure, forging offers many advantages. Huge presses are on order, new forging techniques are being developed, to produce integrally-stiffened aircraft wing and fuselage structural panels.

INTEGRALLY-STIFFENED SKIN REVOLUTIONIZES AIRCRAFT CONSTRUCTION

forged sections

FIRST OF A SERIES

The need for reduced production costs and increased structural efficiency in aircraft construction has led to investigation of a revolutionary new fabrication procedure. The industry is now investigating and developing the manufacture and use of large sections of integrally-stiffened surface structure. The idea is to make in one piece components which are now multi-piece combinations in the conventional skin-and-stiffener structure.

Interest in this development is not limited to the aircraft industry. It is of great importance to those who supply the industry with tools and structural materials. And should, as seems possible, integrally-stiffened structure find application in other industries—such as automotive, containers, and building materials—the impact on industry in general will be substantial.

Much development is indicated to take full advantage of the potentialities of integrally-stiffened structure, in the production of aircraft structural materials, in metalworking machinery, and in production methods. Larger materials sizes are desirable. Larger presses and machine tools will be necessary to handle this material. Already the Air Force has ordered, for production development, presses for larger than any ever before built: a forging press with a capacity in excess of 50,000 tons, and an extrusion press with a capacity of over 15,000 tons.

Equipment will be needed to rapidly and economically do machining of great complexity.

By P. E. SANDORFF (l.), *Research Engineer*
and GEORGE W. PAPEN (r.), *Manager, Production Engineering Dept.*
Lockheed Aircraft Corp., *Burbank, Calif.*

Machines with elaborate automatic sequencing controls, and high-speed, multiple-spindles are being developed. A multihead slab milling machine with a 500-hp, 5000-rpm motor has been proposed.

To utilize the advantage of integrally-stiffened structure, bigger base stock is desirable—wider sheet and plate, and larger extrusion and forging billets. And, techniques and equipment for rolling tapered sheet, and sheet with rolled-in stiffening ribs, are being investigated.

These are examples of the type of development which will be stimulated by the use of integrally-stiffened structure. It is probable that such structure and the techniques of making and using it will be useful in other manufacturing operations. This would stimulate more extensive development. The total impact on industry promises to be substantial.

The development of integrally-stiffened structure represents a revolution in aircraft construction which is of vital importance to those who supply material and equipment to the aircraft industry. The machines, techniques, and materials developed may prove of importance in other industries as well.

This is the first of a series of four articles which will summarize development to date on the methods of producing integrally-stiffened structure: forging, casting, extruding, rolling, and machining. Advantages, limitations, and indicated applications of each will be discussed.

Several Manufacturing Methods Used

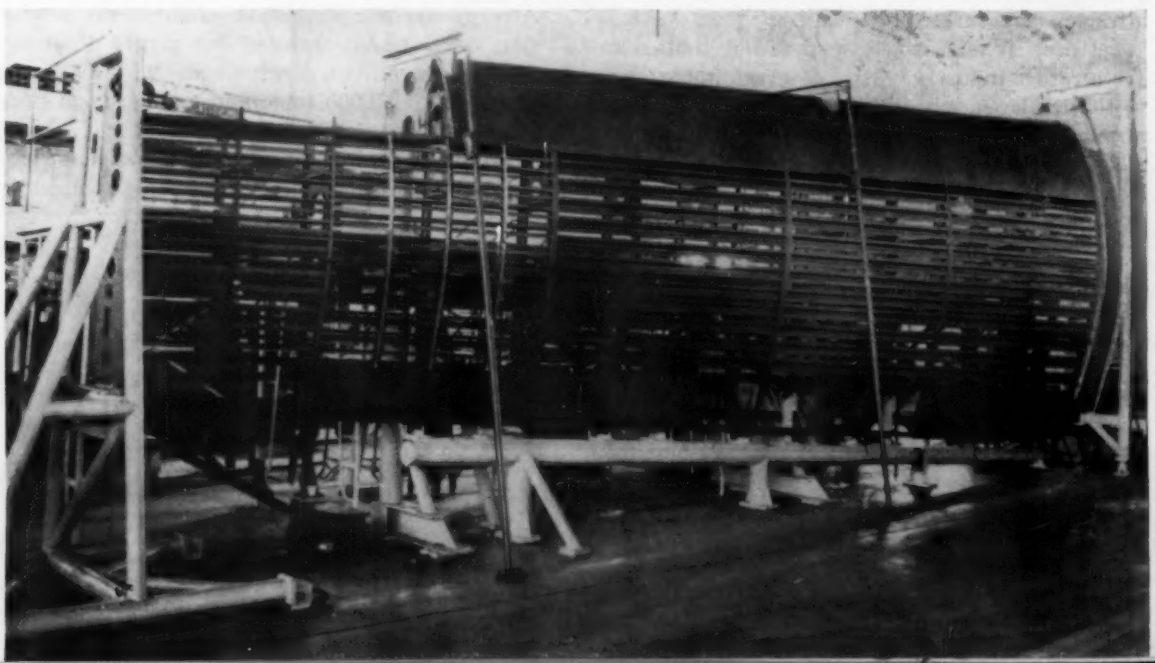
The name integrally-stiffened structure is applied to construction in which the skin and skin-stiffening elements are made of one part, instead of being built up of sheet material attached to many individual stiffeners. There are several methods of making such structure: It may be machined from heavy plate, or it may be forged from billet, or rolled similar to a sheet product, extruded or cast—or a combination of these processes may be used.

The immediate advantages of such a structure are the reduction in number of parts and attachments and the reduction in handling expenses and assembly tooling. Other advantages are also generally obtained, such as reduced weight, improved surface smoothness, and simplified sealing. Disadvantages are chiefly those associated with fabrication of the integrally-stiffened sheet product.

Aircraft surface structure must conform to internal and external shape requirements while supporting specified loads. Generally these loads include normal pressure or air loads, wing and fuselage bending which causes axial stresses in the surface elements, and overall torsion which places shear in the skin.

Conventional skin-stressed structure has been developed to meet these requirements with high efficiency in terms of weight. Essentially such structure consists of: *(1) The external sheet or skin; (2) a system of stiffeners which rigidize the skin locally and, together with the skin, carry the major surface stresses; (3) a system of regularly spaced internal supports which establish the column length or the bending length of the skin-and-stiffener combination, and also transfer shear load; and (4) still another system of elements parallel to the skin-stiffeners, whose purpose is chiefly to preserve shape or carry beam shear.* Generally there is a taper in size and strength of all elements along the length of the

FIG. 1—An aircraft wing being assembled by conventional methods. In this single component, the dozens of individual stiffening elements visible demonstrate the magnitude of the fabrication and assembly job. Over a million rivets are required in assembling the skin-and-stiffener structure of one wing for a large plane.



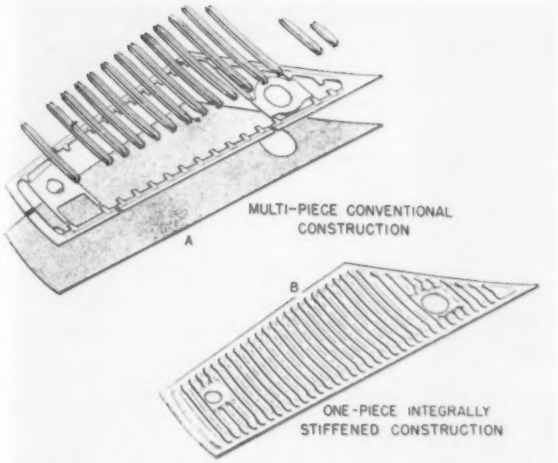


FIG. 2—A typical high-speed aircraft wing panel, as it would be made by conventional methods, and as it would look if made in one piece by integrally-stiffened construction. The conventional panel would have 19 components, requiring several hundred rivets for assembly.

assembly. A typical example of this construction is shown in Fig. 1.

This method of construction leaves much to be desired in obtaining a satisfactory compromise of the functional, structural and manufacturing requirements. It means the fabrication of many individual parts, few of them alike. Splices and joints are complex, and require much sealing in pressurized or tank structures. An incredible number of fasteners is required to assemble all the parts of an airplane.

Millions of Rivets Required

In larger sized aircraft, material stock sizes have begun to determine the number of parts and location of splices and joints. The number of attachments in the assembly under these conditions increases in a ratio approaching the cube of the linear dimension. For example, the wing surface of a Lockheed Constellation contains over 1 million rivets.

Structural weight suffers by compromise with what is practical from a manufacturing standpoint. Design at joints, splices and intersections of systems of elements is critical. Surface smoothness suffers from having many attachments through the skin, flush-milling often being required to smooth the surface. Compromise with production methods often leaves local areas unsatisfactory aerodynamically.

Design for trans-sonic and supersonic speeds has resulted in greatly accentuating these production difficulties. And the amount of equipment carried in modern aircraft makes space requirements more severe, as does the larger fuel volume necessary.

Among the developments aimed at reducing these problems are tapered sheet, tapered extrusions, and tailored sheet. Experimental quantities of sheet rolled with a taper are available, and there are machine shops specializing in machining tapered sheet from plate. Tapered extrusions offer possibilities in material conservation, reduce machining time, and reduce the number of splices and parts required for section taper of stiffeners and beam caps. Some aircraft companies and private machine shops are setting up machines for producing tailored sheet, which is not only tapered but also includes such section changes as doublers and attachment pads.

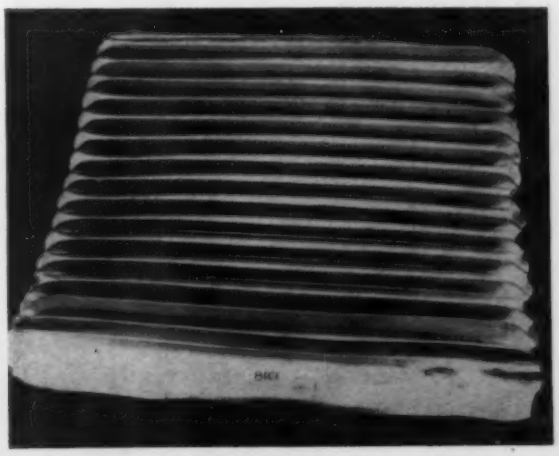
Each of these, however, attacks only a small portion of the problem. Integrally-stiffened structure attacks all phases. It combines the advantages of tailored sheet with integral stiffeners, thus further reducing the number of parts, number of attachments and number of intersections. It makes possible the use of long-length stock incorporating taper and attachment pads, greatly reducing number and complexity of splices and effecting both weight and production savings.

The study reported in this article discusses and compares all the various methods of making integrally-stiffened structure. It is based on Lockheed research and experience, and on Air Force development work being carried on by Lockheed and other manufacturers.

Huge Forging Presses Used

One of the processes currently under investigation is press forging. Production of thin-skinned surface panels with deep-section integral stiffening by press forging has become more feasible with recent advancements in technique and press capacity. During the war Germany had a press of 30,000 tons capacity. Some large slab-shaped parts were made in quantity on this press, but none approached stiffened skin surface structure in minimum thickness or complexity of detail. The largest press in this country has a capacity of 18,000 tons and is operated by Wyman-Gordon

FIG. 3—An integrally-stiffened panel made by forging. This panel is 25 in. square, with 1-in. stiffeners spaced at 1½-in. intervals. Investigations to date have definitely established the practicability of making large surface panels by forging.

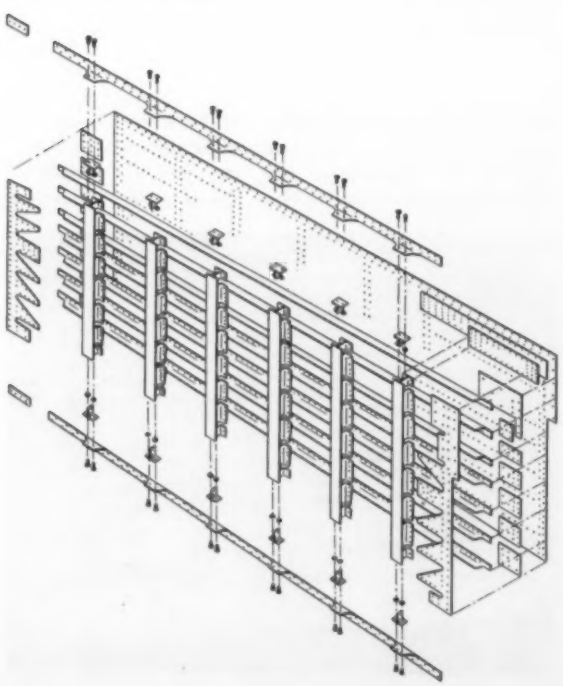


Co., Worcester, Mass. The Air Force has on order a forging press in excess of 50,000 tons capacity. (THE IRON AGE, Jan. 18, p. 75.)

Under a USAF contract Lockheed is now working with Wyman-Gordon to determine if integrally-stiffened structures can be profitably produced by press forging. Considerable progress has been made in development of dies and in forging technique. Results of an early phase of the program are illustrated in Fig. 3. This panel is 25 in. square with 1-in. stiffeners spaced at 1½-in. intervals. A few years ago the forging of such specimens was considered impossible; results to date definitely prove the feasibility and practicability of making large surface panels by this method, although more development work remains to be done.

The question of forging to finished contour or forging flat is still to be answered. Forging dies which will produce a part to finished contour may be more expensive than dies producing only a flat blank. However, if the dimensions can be held within required limits, it would eliminate forming. If dimensions cannot be held, or surface smoothness is insufficient, other additional machining or straightening operations are required. If the forging could be made to required contour dimensions, and surface smoothness was satisfactory, the problem of machining for desired accuracy at joints and other attachment areas would be more difficult than if the part were flat.

FIG. 4—An exploded view showing the components in a conventional P-80 center wing lower removable panel. It has 49 separate parts, and requires 24 screws and nuts, and 1065 rivets in assembly.



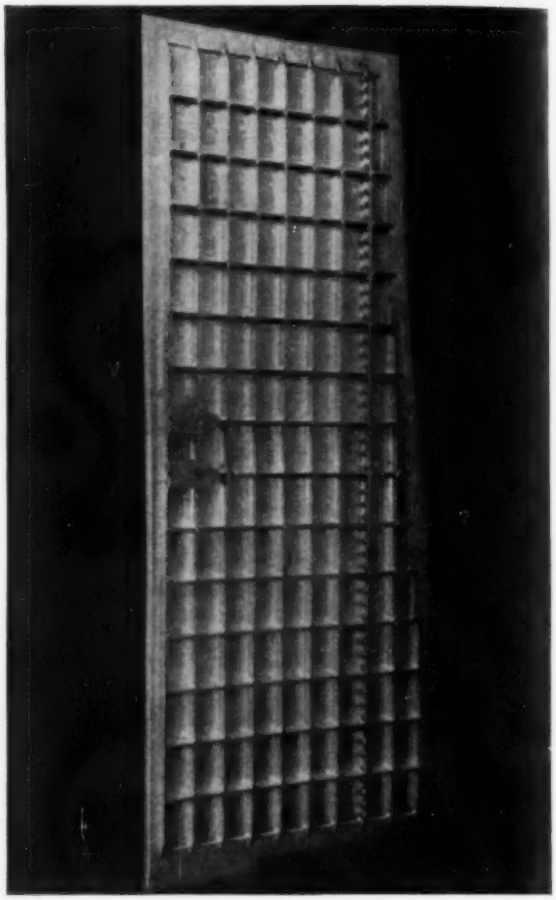


FIG. 5—The same removable panel shown in Fig. 4, as it would look if made as a one-piece integrally-stiffened structure by forging. This particular part was machined from plate, to simulate a forging. The joint on the right was necessitated by the limited size of plate available. If put into production as a forging, this part would be all one piece, with no joint.

Press forging would practically eliminate fabrication and subassembly operations in the aircraft plant. The high initial cost of dies and equipment, however, may offset the savings in other operations when total quantities are low or indefinite.

Forging Gives Weight Savings

In certain cases considerable weight advantage may be found by press forging. The wing panel illustrated in Fig. 2 weighs 76 lb in conventional construction; as an aluminum alloy forging, its weight is only 56 lb; if forged from magnesium alloy, 46 lb.

Fig. 5 illustrates the design of a wing surface panel for press forging. The panel must carry both end-compression and normal air pressure; in this case this is best accomplished with two sets of stiffening elements. In the forged design these are obtained by the waffle-grid arrangement. The weight is the same as that of the conventional design, but the part is one piece instead of being made from 49 components.

By DR. ROLAND B. SNOW
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Kearny, N. J.

TEMPERATURES

of openhearth bottoms measured

Rammed bottoms of the same depth show similar thermal gradients providing equal insulation is used. Drill core data show all bottoms eroded to about the same depth after limited service regardless of composition or burning-in schedule.

PART I

The temperature attained at various levels in a pan-type openhearth bottom during the heating up, burning-in and operating periods are of practical importance to operators. Furnace time may be lost during burning-in by the injection of a series of steps which may have little actual value in the overall performance of a bottom. Temperature measurements in the brick work provide data for judging the expansion allowances for different hearth thicknesses and with different burning-in schedules. This is an important consideration if the brick work is to be tight during the normal operations. Temperature measurements in the rammed portion of a hearth not only show the possible depth of the ceramic set in the rammed layer but also provide information as to the strains which may be present in a bottom between tapping and charging. Temperatures in hearth sections of only slightly different construction may aid in designing a hearth having maximum protection against break-outs and a minimum heat loss.

Part II will appear in The Iron Age *of February 8.*

The results reported here are based on measurements made with a total of 27 thermocouples distributed among six openhearth bottoms. With the exception of three chrome-alumel couples in one furnace, all couples were protected by at least one, and usually by two, closed end protection tubes of quartz glass or porcelain, depending upon their position in the bottom. In two of the hearths this outer protection tube extended from the tip of the inner tube only as far as the upper course of the chrome brick and the inner protection tube, with only a $\frac{1}{8}$-in. ID hole, extended through the remainder of the bottom.

Temperatures Automatically Recorded

The temperatures were recorded automatically. However, in some cases a complete record was not obtained for all the couples because of failure of the couple due to contamination by lead, tin or zinc, or because the recorder would not accommodate all of the couples. Only three of the platinum-platinum 10 pct rhodium couples were intact when removed from the furnaces but these were found to have retained their original calibration; the others all shorted out during service.

In each furnace the thermocouples were placed in the hearth just before the subhearth was rammed; the brickwork was removed from the area and a hole was burned through the pan. The brick were cut while replacing them so that they fit around the thermocouples protection tubes and the voids were filled with either fireclay or chrome-ore cold setting cement depending upon the brickwork. No breakout occurred as a result of the insertion of the couples in these bottoms. However, if a material other than a fine-grained, cold-setting cement is used around the protection tubes difficulty may be encountered in holding the tubes in place owing to the lack of bond between them and the brickwork.

Those couples which extended into the rammed layer were protected during the ramming opera-

tion by a 3-in. diam pipe held so as to prevent the rammer from damaging the couples and protection tubes. After the layer had been rammed the pipe was removed and the intervening space was rammed by packing loose material with blows of a mason's hammer on a 1-in. diam rod. Subsequent layers were rammed in a similar manner until the couple was covered; then normal ramming was carried out over the entire area.

Dr. R. B. Sosman reported temperature measurements in openhearth furnaces in his Howe Memorial Lecture entitled "Temperatures in the Openhearth Furnace."[1] Temperatures found in this furnace (A) and in the others of the same construction are indicated in Fig. 1; the tempera-

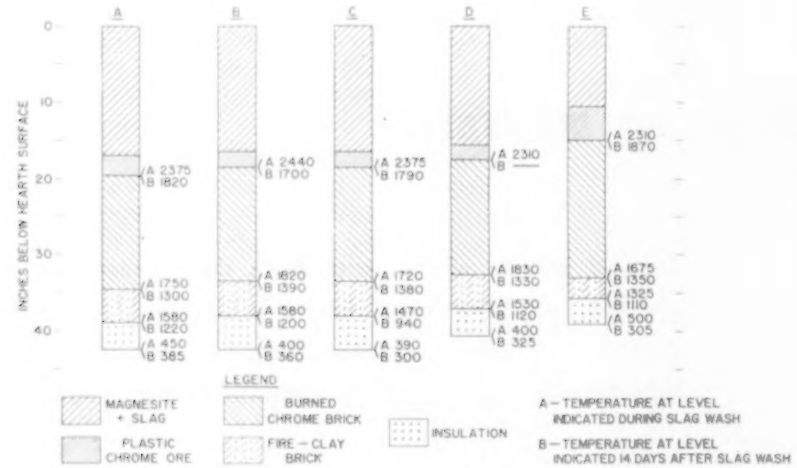


FIG. 1—Sketches of hearth sections with temperature data for grain magnesite—slag bottoms.

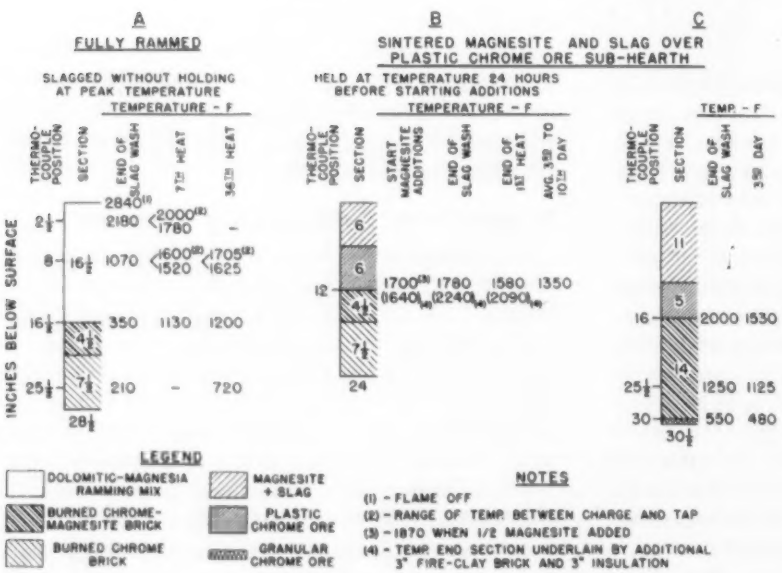


FIG. 2—Sketch of relatively thin hearth sections showing thermocouple positions and temperatures during burning-in and during steelmaking.

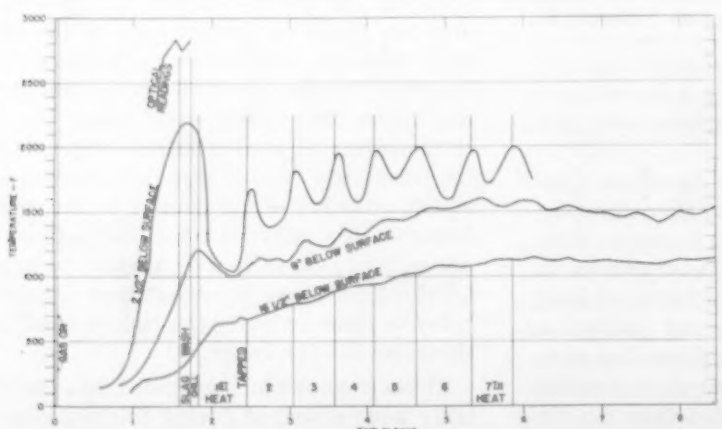


FIG. 3—Temperature record for thermocouples placed in hearth section A, Fig. 2.

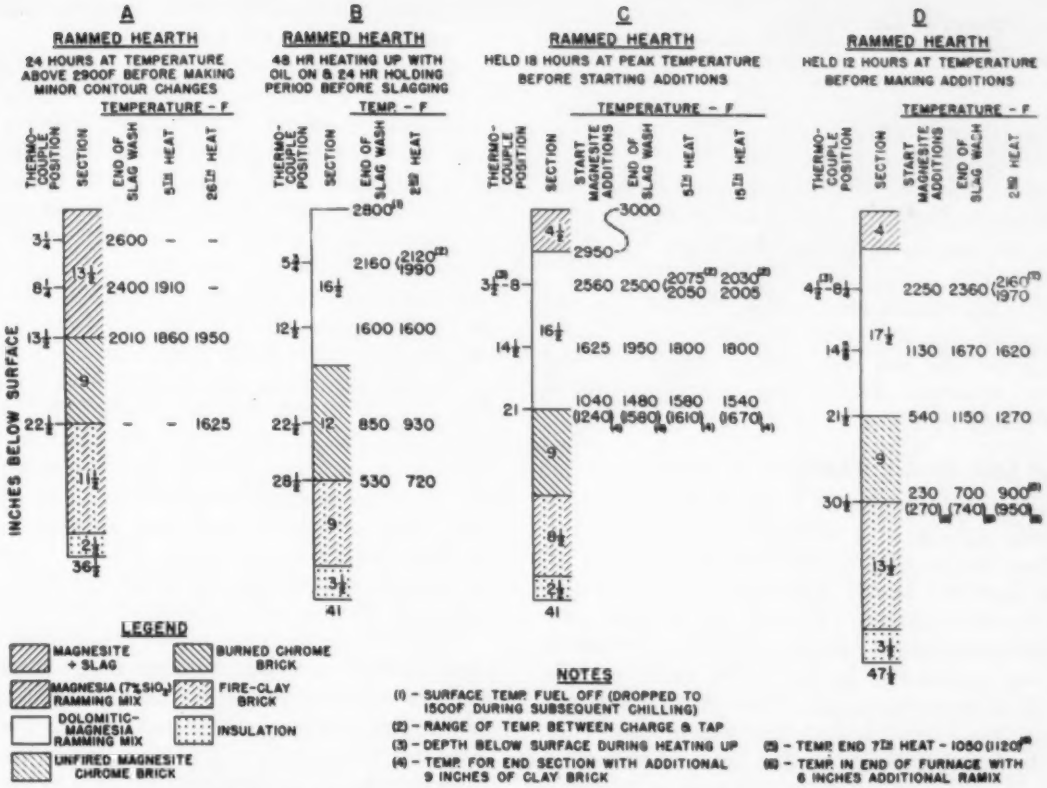

A
RAMMED HEARTH
24 HOURS AT TEMPERATURE ABOVE 2900F BEFORE MAKING MINOR CONTOUR CHANGES
TEMPERATURE - F
THERMO-COUPLE POSITION
SECTION
END OF SLAG WASH
5TH HEAT
26TH HEAT
INCHES BELOW SURFACE
B
RAMMED HEARTH
48 HR HEATING UP WITH OIL ON & 24 HR HOLDING PERIOD BEFORE SLAGGING
TEMP. - F
2ND HEAT
C
RAMMED HEARTH
HELD 18 HOURS AT PEAK TEMPERATURE BEFORE STARTING ADDITIONS
START MAGNESITE ADDITIONS
15TH HEAT
D
RAMMED HEARTH
HELD 12 HOURS AT TEMPERATURE BEFORE MAKING ADDITIONS
LEGEND
MAGNESITE + SLAG
BURNED CHROME BRICK
MAGNESIA (7% SiO2) RAMMING MIX
FIRE-CLAY BRICK
DOLOMITIC-MAGNESIA RAMMING MIX
INSULATION
UNFIRED MAGNESITE CHROME BRICK
NOTES
(1) - SURFACE TEMP. FUEL OFF (DROPPED TO 1500F DURING SUBSEQUENT CHILLING)
(2) - RANGE OF TEMP. BETWEEN CHARGE & TAP
(3) - DEPTH BELOW SURFACE DURING HEATING UP
(4) - TEMP. FOR END SECTION WITH ADDITIONAL 9 INCHES OF CLAY BRICK
(5) - TEMP. END 7TH HEAT - 1080 (1120)
(6) - TEMP. IN END OF FURNACE WITH 6 INCHES ADDITIONAL RAMIX

FIG. 4—Sketch of relatively thick hearth sections showing thermocouple position and temperatures at stages in burning-in and during steelmaking.

ture below the thin subhearth of plastic chrome was approximately 2400°F during slag washing and 1800°F during normal operation of the furnace. These furnaces, which are of approximately the same hearth construction, show nearly equivalent temperatures at corresponding levels.

The temperatures found in three relatively thin hearths of various construction are shown in Charts A, B and C in Fig. 2. In Chart A the hearth was slag washed without holding at peak temperature; normally such a hearth is held at 3000°F for 12 to 24 hr before making any addition. The continuous temperature record for this bottom is shown in Fig. 3. These data indicate a temperature of only 1040°F at a position 2½ in. below the hearth surface midway through the first heat. The simultaneous temperature 8 in. below the surface for the first seven heats is indicated. Peak temperatures usually occurred from 15 to 60 min after a heat was tapped. Minor fluctuations in temperatures which might be attributed to additions or to blocking of the heat did not show on the original chart. The cyclic nature of the curve for a position 8 in. below the surface is interesting but these peaks appeared from 3 to 5 hr after the peak occurred in the upper curve. The temperature at this position rose to 1500°, 1705°, and 1825°F during the 7th, 36th and 78th heats, respectively. The temperature 16½ in. below the surface was 1130°, 1200° and 1250°F during the 7th, 36th and 78th heats. The couple 25½ in. below the surface, showed a temperature of 675°, 700° and 725°F during the 14th, 36th and 78th heats.

Center Insulation Cuts Heat Time

Chart B (Fig. 2) shows a slightly thinner hearth section where the brick work has the same construction as for the rammed hearth in Chart A. The temperature of the junction between the brick work and the plastic chrome ore subhearth at the time magnesite-slag additions were started was 1700°F and rose to 1870°F when half the magnesite-slag layer was added but was only 1780°F during the slag-washing period. During the 6th heat the temperature at this location was 1350°F, which is approximately 100°F below that of the corresponding extrapolated depth in the thicker hearth of Chart A. In the end of the furnace where the underlying brickwork includes 3 in. of fireclay brick and 3 in. of insulation, the temperature at the brick-plastic chrome ore interface was approximately 550° higher during slag washing and during the first heat than at a corresponding position in the uninsulated center portion of the hearth. The first helpers on these furnaces reported that lime and ore were usually up in the ends much before they were in the uninsulated center, indicating that insulation in the center might aid in reducing heat time on these furnaces.

Chart C in Fig. 2 is the hearth reported by Al-

win F. Frantz[2] which has almost the same construction as that of Chart B though it is slightly thicker. At the junction between the plastic chrome ore subhearth and the brickwork the temperature was found to be 1530° after 3 days of steelmaking.

Sketches of rammed hearths with, or without, magnesite-slag surfacing are shown in Fig. 4. These hearths are arranged according to total hearth thickness. Part of the record for hearth C is shown in Fig. 5.

Heat Loss During Charging Is Great

During the burning-in of the rammed material, furnace A, Fig. 4, a temperature of 2775° was reached 3¼ in. below the surface. The loss of heat from the hearth after chilling and charging is very marked. During the chilling and charging period the hearth lost 400° of temperature at a level 8¼ in. below the surface. The peaks on the temperature curve at this level occurred 2 to 5 hr after each heat was tapped. This couple failed during the 6th heat. The couple 13½ in. under the surface indicated a temperature of 1850°F after the first heat was tapped and remained nearly constant until the furnace was dampered 5 days later. The temperature rose during the subsequent 5-day period to 1950°F and remained nearly constant until the furnace was again taken off production 5 days later.

In Hearth B (Fig. 4) the temperature of the surface was apparently much lower. The couples 5¾ and 12½ in. under the surface barely reached a constant temperature when the first heat was tapped and shorted out 2 days later.

Hearth C received an 18-hr holding period above 2900°F prior to sintering of 4½ in. of a magnesite + 10 pct slag mixture. After a light slag wash the temperature 8½ in. below the surface dropped approximately 400° to 2100°F which is about 100° greater than the corresponding temperature for furnace A of this group. The temperature 14½ in. below the surface is of the same order of magnitude as was found at a corresponding position in furnace A (Fig. 4). An interesting point in this furnace is the difference in temperature at the Ramix-chrome brick interface, which is only approximately 150° greater in the end section, where 9 in. of additional fireclay brick are present in the hearth, than in the center of the hearth. Since fireclay brick will not hold steel, and since they show no great saving of heat where insulation is present, their use should be confined to locations at which it is necessary to fill space with a relatively low cost brick.

In Chart D the temperature 8¼ in. below the final surface reached the same order of magnitude as was observed in the other three furnaces by the time the second heat was tapped. The temperature at the 14⅝ and 21½-in. levels was considerably below a corresponding level in furnaces A and C of this group. An additional 6 in. in the thickness of the rammed layer increased the temperature of the chrome brick-fireclay brick interface by only 50°F.

References

[1] R. B. Sosman, "Temperatures in Openhearth Furnaces," T.P. 2435, AIME Metals Technology, 15, 1948.

[2] Alwin F. Frantz, "Furnace Bottom Temperature Gradients," AIME Openhearth Proc., 1938, p. 17.

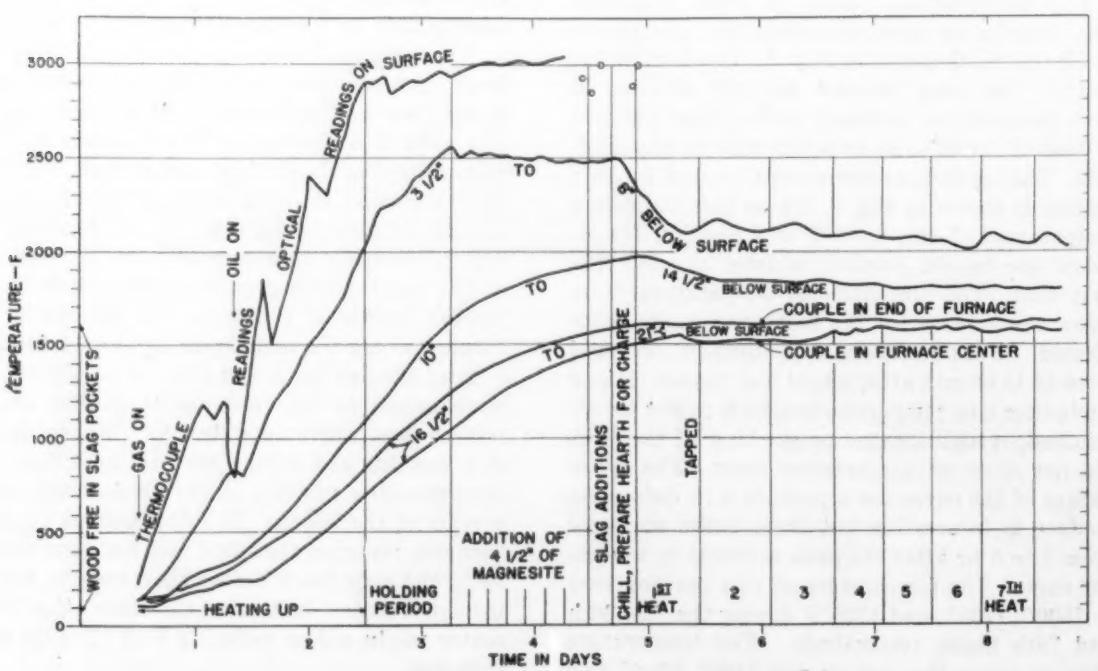
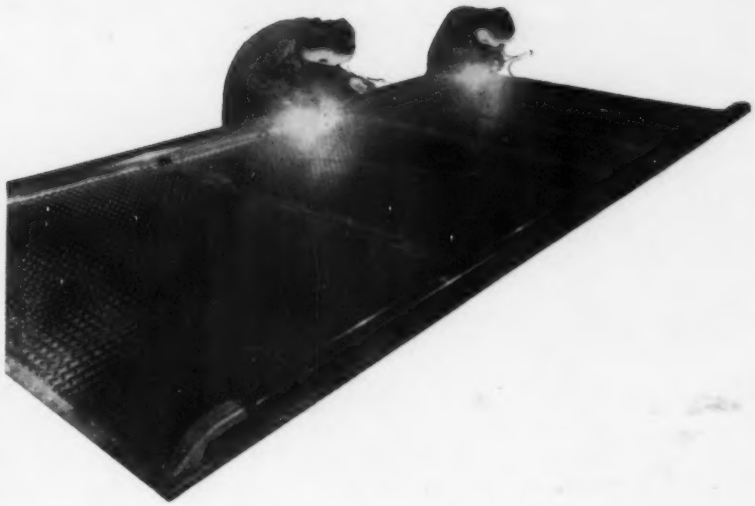


FIG. 5—Temperature record from thermocouples placed in hearth C, Fig. 4.

MAGNESIUM DOCKBOARD

employs extruded, cast, and wrought parts



By GENE BEAUDET
Chicago Editor

In an effort to stimulate industry-wide interest in magnesium applications, the Magnesium Co. of America, East Chicago, Ind., shortly after the war, started to look for a product they could manufacture that would be used by all industries. Their thinking was based on the belief that if they could manufacture such a basic item, it would result in a demand for other magnesium products from all types of industry.

After considering many possibilities, MAGCOA decided to build dockboards made from magnesium. Since every industrial plant has a loading dock on which material is transported from railroad cars and trucks, a dockboard made of magnesium would be the most likely means of acquainting industry in general with the qualities of magnesium products.

The development of heavy power loading equipment and its ability to handle increasingly greater loads had resulted in the need for an improved type of bridge ramp capable of supporting heavy loads more safely. In 5 years, magnesium dockboards have been placed in over 10,000 locations throughout the country. In addition, magnesium hand trucks, grain shovels, maritime gangplanks, can forks and many other items are now being manufactured.

Old Dockboards Inadequate

The growing acceptance of magnesium dockboards in materials handling is in great part due to the fact that the usual types of bridge ramps have proved inadequate in many cases. All too often a plain piece of heavy steel plate has been used. Heavy and cumbersome to handle, these plates present a definite safety hazard. In many cases accidents to personnel and damage to materials have resulted because the plates are incapable of withstanding heavy loads without buckling. They are also extremely difficult to secure properly and often shift out of position. Furthermore, their excessive weight makes them impossible to handle quickly and efficiently.

To overcome these difficulties, MAGCOA has developed a dockboard that is just as strong, considerably lighter and far safer than the conventional steel plate. Made entirely of magnesium, the dockboard weighs one-third to one-fourth as much

Just as strong but 1/4 as heavy as steel plates, this all-welded magnesium dockboard is finding wide application. Each dockboard is individually designed. Some carry 30,000-lb axle loads, but typical designs carry around 1000-lb axle loads.

DOCKBOARDS about to enter stress relieving furnace where warping and internal stresses produced by welding are eliminated.

as steel plates of comparable strength. This factor speeds up operations, reduces handling accidents and cuts down on fatigue. In addition to the advantage of lighter weight, the dockboard has other features which add to its desirability. Reinforcing members on the underside of the dockboard increase its strength and prevent the dockboard from slipping out of position. The rounded slope of their special guard rails on the outer edges prevent runoffs of expensive loading equipment. These low guard rails or curbs also give maximum clearance for loading equipment and prevent damage to tires.

Mg Dockboards Custom-Built

Every dockboard is designed individually for each application because of the many variables at loading docks. Before a dockboard is manufactured, a company representative visits the site of the future installation and collects such data as the type of the materials handling equipment used and the maximum loads carried, the difference, if any, in height between the loading dock, the distance between the vehicle and the dock, the width of dockboard desired and any other information bearing on the proper design of the dockboard.

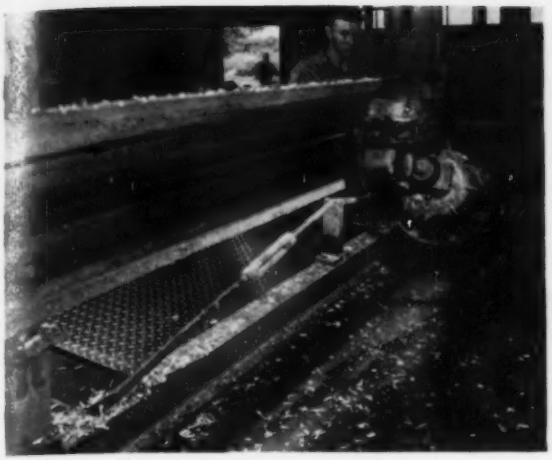
Each dockboard has three major components: the deckplate, the underframe and the guard rails. The deckplate, with a nonskid surface, is cut out of plate 36 by 48 in. wide by 60 to 144 in. long with thicknesses varying from ¼ to ⅝ in. It is cut and beveled at each end by a carbide-tipped high-speed saw equipped with a trailing bevel cutter. On installations calling for a very wide dockboard, two plates are buttwelded together automatically by a mechanized Heliarc torch.

The underframe consists of standard structural magnesium shapes such as channels or I beams. These beams serve as reinforcing members to give added strength and are placed so that they prevent the dockboard from shifting out of position when in use. After the parts of the underframe are cut to specified lengths, they are tackwelded to the underside of the deckplate in the required positions.

The special guard rails are extruded. Together with the reinforcing members they have been designed to act as the principal longitudinal load carrying members and also act as side runoff preventatives.

After the guard rails are cut to size, they are tackwelded to the topside edges of the deckplate. However, they do not extend the full length of the edges. Nine inches from each of the four ends, tapered and rounded magnesium castings are welded to the extremities of the guard rails and to the deckplate. They contain hand holes on the outer side of the casting for safety and convenience in handling and allow a greater turning radius for loading vehicles. The plates and extrusions are made of F S alloy while the castings are made from H alloy.

When the components have been tackwelded into position, long filet welds are made which join the parts into one complete unit. Finished welds are smooth and uniform. The only finishing op-



SPECIALLY DESIGNED machine cuts and bevels magnesium tread plates. Machine bevels ⅝-in. plate in one operation.

INSPECTION prior to shipment. Finished dockboards are shown in background.

RAMP DOCKBOARD compensates for height differentials, provides smooth entry into truck and allows truck to park flush with loading dock.

eration that is necessary is quick wire brushing.

The welding process used in the entire operation is the Heliarc or inert gas shielding process developed by Linde Air Products Co. The use of this process makes the welding of magnesium an easy operation that can be done on a regular production basis. By this method an inert gas, usually argon, protects the arc from the air and eliminates the forming of oxides in the weld. Magnesium welding rods are used throughout the entire operation.

When all components have been joined by welding, the dockboard is passed into a stress relieving furnace where it is heated for periods of approximately 2 hr at temperatures ranging from 350° to 500°F to eliminate the small amount of warping and internal stresses resulting from the welding process. It is then removed and is ready for use.

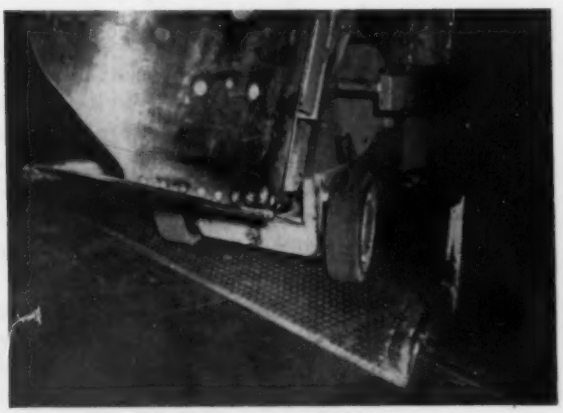
In some cases a zinc chromate primer and corrosive resistant paint are applied to the finished dockboard. This is to protect the dockboard surface from corrosive atmospheres and conditions such as those encountered when they are used to unload refrigerator cars. Magnesium, however, has extremely good corrosion resistant properties under normal usage.

Mg Dockboards Easily Moved

Although some dockboards as much as 20 ft long and 6 ft wide, with the ability to support a 30,000 lb axle load, have been designed, a typical dockboard would be 60 in. wide and 48 in. long. Such a dockboard, capable of carrying an axle load of 1000 lb, weighs about 75 lb. A steel plate of equal strength would weigh four times that much and require the services of more than one worker to move it, whereas the magnesium dockboard can be easily moved and positioned by one man.

The load carrying capacity of a dockboard depends on its size and the thickness of plate used. A ¼-in. plate will carry up to 1000-lb axle loads, a ⅜-in. plate will carry up to 4000 lb, and ½-in. plate up to 12,000 lb, with suitable reinforcement.

FLARED dockboard increases maneuverability of heavy fork lift equipment where dock space is limited.



By B. M. PEARSON
Hassocks, Sussex, England

STEEL STRIP EXPERIMENTALLY RO

Continuous sheet and strip have been successfully made from iron powder in German laboratories and steel plants. Properties and characteristics of these experimental products are similar to those of normally rolled materials of the same chemical composition. The methods of fabricating powdered metals and alloys in continuous forms indicate practical solutions to the problems of rolling those alloys difficult to produce by ordinary openhearth-ingot-rolling processes. This is particularly true of those materials which, at present, are most easily readied for forming work by first producing them in the form of sponge and/or powder. For such materials, these new techniques offer a means of forming and shaping to specific sizes and thicknesses without any preliminary working.

Previously Believed Impossible

Previously, it has been thought impossible to produce forms from metal powder of any considerable length. The difficulty of avoiding variations in density inside pressed shapes has limited cross-sectional thicknesses as well. Prior to the recent developments in Germany, there was one method, proposed by G. Wasserman,[1] for producing sinter products of any desired length. This involves drawing down a tapered tube which has been filled with metal powder. A drawbench or enclosed grooved rolls are required.

Research was started on the continuous rolling of powdered metals when, in 1942, German metallurgists wanted some thin test pieces for special investigations[2] of RZ iron powders. It proved surprisingly easy to produce strip by rolling.

Preliminary rolling tests based on this previous experience[3,4,5] showed that results depended largely on particle shape and sieve analysis, as with pressed and sintered products. Among the major factors affecting rolling of metal powders are the width of the opening between the rolls and their diameter, number and extent of the additional passes given the sintered strip, the turning speed of the rolls and the power loading reserve of the driving motor.

TABLE I
ANALYSIS OF RZ POWDER USED

	Particle Size in mm					
	<0.30	0.15 to 0.3	0.06 to 0.3	<0.15	0.06 to 0.15	<0.06
Composition, pct						
C	0.03	0.03	0.02	0.03	0.03	0.06
Mn	0.19	0.14	0.27	0.23	0.16	0.26
P	0.028	0.044	0.028	0.012	0.036	0.068
S	0.017	0.032	0.014	0.017	0.022	0.056
O_2	0.30	0.20	0.44	0.39	0.33	0.54
Sieving Analysis, pct						
>0.30	1.5	2.8	—	—	—	—
>0.15 ≤0.30	34.8	93.3	46.0	1.0	4.7	—
0.06 ≤0.15	49.0	3.0	51.3	78.9	93.6	—
<0.06	14.2	—	2.5	19.8	1.3	100
Pouring volumes cc³/100 g	40.3	43.0	48.3	43.5	41.0	39.0
Rapping volumes cc³/100 g	34.6	36.0	38.8	36.3	34.0	32.5
Filling density g/cc	2.48	2.33	2.16	2.30	2.44	2.56
Rapping density g/cc	2.89	2.78	2.58	2.76	2.94	3.06
Space Filling, pct	31.7	29.8	27.6	29.4	31.2	32.7

LY ROLLED FROM POWDER PART 1

Only an alloy's composition determines the properties obtainable by roll-forming, sintering and cold rolling it from the powder. This summary of the recent Report No. 6 from the German Iron & Steel and Engineering Societies tells how it has been done. For metals such as titanium, which are highly reactive with oxygen, this process may find application in producing certain shapes.

One of the first objects of the research was to investigate each of these influences and their effects on one another. At first, the work was confined to soft iron sheet and strip.

RZ iron powder with a normal sieve grading (particle size, 0.3 mm) was used almost exclusively for the tests. This is a melted-and-atomized powder with a spherical or spherical fragmented structure that provides a high grade, economical material. The chemical composition and the most important powder-metallurgy characteristics of this powder are given in Table I.

At first, attempts were made to feed the powder to the rolls by distributing it in a uniform thickness on sheet metal or paper. It was then introduced between the rolls, which were arranged vertically over one another as in normal practice. Undulations formed in the powder immediately before the rolls, particularly when compression was increased. These irregularities were drawn into the rolls and caused variations in thickness and compactness of the pressed strip. Cracks started at the edges as a result, and buckling or tearing of the under layer soon followed, with complete destruction of the strip.

Rolling Stand Turned On Side

Turning the rolling stand on its side was then tried and the powder fed from a box, arranged so that its slot-shaped opening was about the same length as the rolls and located some millimetres above the entry to them. It was soon established that below a definite roll clearance the rolls automatically took just the right quantity of powder. Accordingly, the pressed strip showed a uniform thickness and density. The slot in the feed box need only be big enough to maintain a sufficient reserve of powder between the rolls above the entry. It was necessary to close off the rolls on the top side at the ends so that the powder would remain in the desired position.

By interrupting the rolling operation it was possible to follow in detail the formation of the

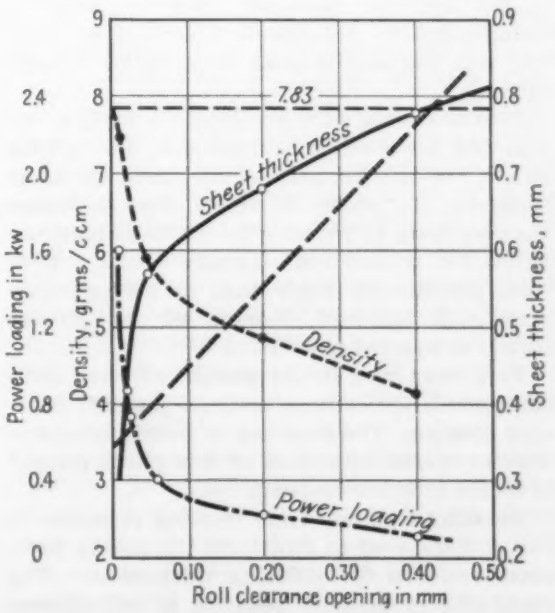


FIG. 1—Influence of size of roll clearance opening on thickness, density and power consumption.

strip in the roll clearance. The powder is drawn down by the friction of the rolls. Increasing contact between the iron particles develops and a progressive interlocking of them takes place over the medial line of the roll opening. Finally, at least those particles on the surface remain permanently formed. Calculation of the strip thicknesses at the beginning and end of the forming demonstrated that an angle of nip of 8° accomplishes the pressing of the powder. The density of strip 0.45 mm thick under these conditions was 6.25 g per cc.

The factors governing the maximum and minimum sheet thicknesses obtainable with given equipment at different settings was determined. The maximum usable roll clearance is that which will provide a strip or sheet with sufficient strength to maintain structural soundness through the initial rolling and sintering steps. The lower limit is governed by the amount of deflection caused by the rolls impinging on one another—and thus, by the characteristics of the individual rolling mill itself. Yet a simple relationship between the roll clearances and sheet thicknesses is not obtained, at least in the middle range (see dotted straight line in Fig. 1). Instead, the curve representing sheet thickness rises steeply at first as the roll clearance increases and then continues in a relatively flat line.

Also Determined Densities

To aid in investigating the apparently complicated processes influencing sheet thickness, density was simultaneously ascertained. The curve representing density in Fig. 1 shows that this property increases in practically a linear manner as roll thickness decreases. However, below a definite, critical roll clearance, located at about 0.07 mm, the density rises very rapidly to high values.

Similar curves were developed for strip thickness and for power consumption by the driving motor. In the flat part of the curve for sheet thickness, the power is merely used to reduce the pore space by pressing the particles together. Below the critical roll clearance opening, however, considerable work must be performed to accomplish the cold forming of the already tightly compacted powder.

This steep rise in the amount of work indicated a relation between pressure and roll clearance opening. The densities of rolled test sheets were compared with those of thin pieces pressed in molds with known pressures.

Densities resulting from pressing pressures in Fig. 2 were used to etraploate the rolling pressures required for differing thicknesses. The rapid rise in pressure required to roll thinner sheet thicknesses can be seen clearly. Pressures up to about 6 tons per sq c could be applied

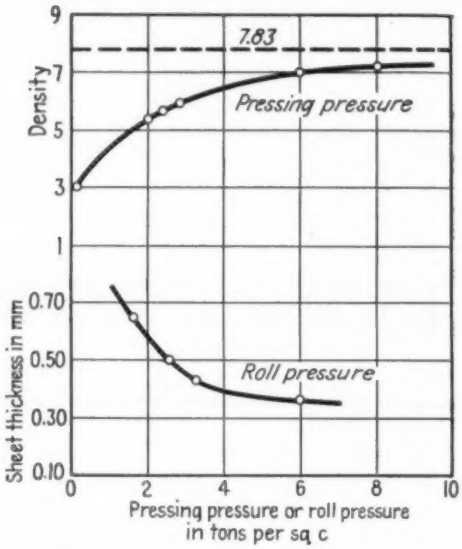


FIG. 2—Effect of pressing pressure on density and the influence of roll pressure on the thickness of rolled, non-sintered sheet. Test rolls, 70 mm diam.

with the small rolling stand used in these tests.

With the small, 70 mm diam rolls, pressed strip 0.35 to 0.75 mm thickness was prepared. Finished strip from this material ranged from 0.25 to 0.35 mm in thickness. Determining the most effective relationships between roll diameters and ranges of unsintered sheet thicknesses for commercial production would require rolling equipment at least approaching that used in normal practice, with rolls arranged side by side. However, to ascertain at least the approximate connections between these two factors, tests were conducted in rolling stands arranged normally, in vertical fashion. The diameters of the rolls involved were 200 mm in the smaller stand and 900 mm in the larger. Unsintered, pressed strips of about the same degree of compacting produced with varying thicknesses of powder feed were compared. Evaluation of these limited tests indicate clearly that the thicker the strip, the larger the roll diameter must be.

Influence of Roll Velocity

The influence of the linear velocity of the roll surfaces is apparently quite considerable, but since the turning speed of the experimental stands could not be controlled it could not be investigated. Rolling tests conducted in a plant having such equipment showed that thicker strip and sheet with a high degree of compacting could be produced, however.

Up to a certain limiting roll velocity, the tensile strength of unsintered strip became four or five times higher. But when the limit was exceeded, a coherent metal band was not formed. The amount of powder fed to the rolls was no longer sufficient. Roll diameter and the clearance between the rolls also influences this critical speed.

Particle size also helps to determine the thick-

ness of sheets that can be produced, just as it is a deciding factor in finished surface quality. At related roll clearance openings, too fine a powder trickles through without being rolled and compacted. Within the range of those roll clearances that are usable with a given selection of particle sizes, the influence of powder gradings is not very great, Fig. 3. The thinnest sheet was obtained with a fine powder rolled through a small roll clearance. The thickest sheet was produced with powder of a normal grading and a larger opening. These powders generally approximated the complete particle size grading curve, with maximum space utilization effect.

Roll Clearance vs. Tensile Strength

Increasing the roll clearance opening decreases tensile strength of unsintered strip as well as density. Tensile strength falls from approximately 1.2 to 0.2 kg per sq mm when the roll clearance is increased from about 0.02 to 0.26 mm. With such low strength, the continuous strip cannot be drawn through the sintering furnace without damage. Because of its brittleness, unsintered strip cannot withstand any considerable bending or distortion.

The pressing phenomena involved in rolling metal powder leads to definite degrees of compactness or density. They also act markedly on tensile strength and the behavior and maintenance of sheet edges. For example, rolling various types of iron powder and also steel, bronze and aluminum powders under identical conditions caused large differences in the power consumption of the roll driving motor. This provided a means of evaluating the forming behavior of various powders. Knowledge of the tensile strengths of the test pieces obtained made it possible to determine the suitability of specific powders for sinter metallurgical purposes.

The properties of the roll surface are also important. If it is damp or moistened with a fine, adherent oil film, a thin, poorly compacted and brittle pressed strip results. It makes little difference, at least where strip thickness is concerned, whether rolls are highly polished or are roughened.

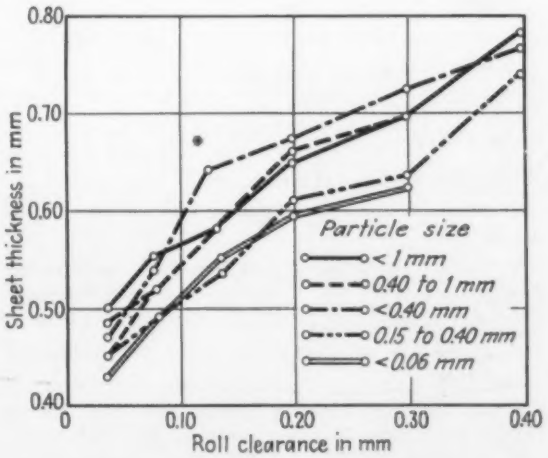


FIG. 3—How particle size affects sheet thickness, at varying roll clearances.

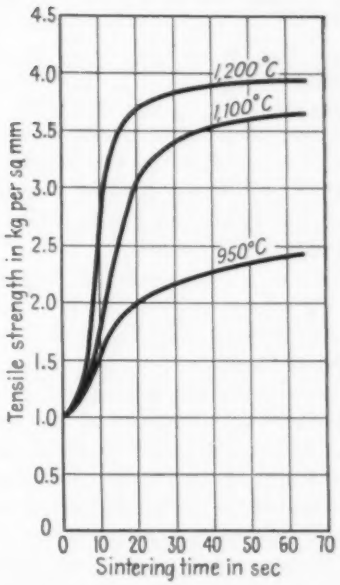


FIG. 4—Relationship of tensile strength to long sintering periods at various temperatures.

Unlike a double-action press, where the direction of pressing lies in one plane, rolling proceeds along gliding planes. Beginning between the horizontal rolls, a continuing bonding and compacting of the powder particles take place. This proceeds up to the maximum strength obtainable with the given roll clearance and other factors present.

Effect of Pressing Pressure

The strength values obtained in rolled powders vary to about the same dimensional extent as with those powdered metal parts pressed in molds. From this it can be concluded that the forming phenomena in the roll clearance is governed by the pressing pressure. For this reason, the rolling of metal powder into strip or sheet may be considered as a continuing molding process performed by narrow, linear-type segmental regions along the surfaces of the rolls. This concept is of importance to powder metallurgy, because it indicates the possibility of commercially usable components and even continuous shapes being produced with roll stands and other specially developed equipment. An additional advantage is that rolling, compared with normal molding presses, require considerably lower-powered driving motors.

As the pressed strip issues from the rolls it is sintered, in a hydrogen atmosphere at a temperature of 1050 to 1100°C. The influence of temperature and time, which stand in inverse ratio to one another, have been a major consideration of this work. Because these investigations were primarily concerned with mold-pressed metal powders where greater wall thicknesses prevail,

heating periods of considerable length were the main problem. Some research on short-time sintering was reported on by W. Eilender and R. Schwalbe[6] and by W. Englehardt.[7] However, up to now very short sintering times have not been measured with iron powder.

In the rolling and sintering of strip from iron powder as a continuous operation, the sintering period can only be a fraction of the time (1 to 3 hr) normally employed in powder metallurgy. The thin pressed strip produced was particularly suitable for short-time sintering, because of the rapid through-heating effect that was possible.

In tests, strips about 120 mm long and 20 mm wide were heated for short periods in a crucible containing a hydrogen atmosphere at 950, 1100 and 1200°C. Next, they were cooled in a second crucible in a nitrogen atmosphere. Periods of 5 to 60 sec were selected as the sintering times, as this represented the practical limits for this part of the projected continuous process.

Importance of Sintering Temperature

The curves in Fig. 4 shows clearly the great importance of temperature in short sintering periods. The first increase in strength occurs quickly and rises even more rapidly when higher temperatures are employed. Any further rise proceeds much more slowly. To reach a tensile strength of 2.5 kg per sq mm requires sintering for 100 sec at 950°C and only 10 sec at 1200°C.

The strength increase occurring in the first few seconds is caused by the test pieces requiring only a few seconds to reach the sintering temperature. The steep rise after this change point, especially at 1200°C and the flattening of the curve indicate that at least two phenomena are involved and super-imposed. The first of these obviously proceeds rapidly and the second requires a much longer time.

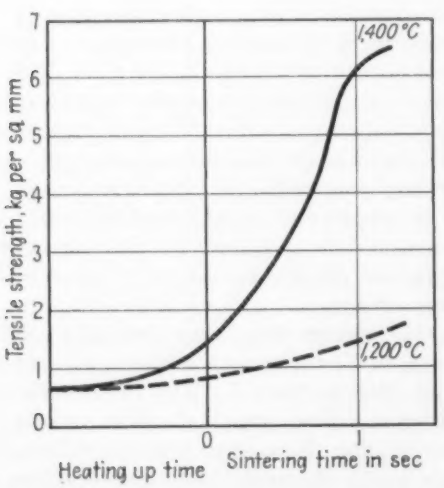


FIG. 5—Influence of short-time, high-temperature sintering on tensile strength.

In an attempt to investigate the possibilities of even shorter sintering periods and higher temperatures, sample strips 10 mm wide were directly heated by direct current resistance heating. The test piece was placed in an insulated metal housing containing a protective atmosphere and was brought very rapidly to the required temperature. It was possible to control closely the rapidity of heating, its duration and the temperature. It was also possible to take measurements of the reaction of the specimens at selected points up to the maximum temperatures used in the tests, by means of cathode ray tube oscillograph.

High Temperatures Tested

The results of two series of tests at 1200 and 1400°C are given in Fig. 5. The time required for the heating up of the test pieces was ascertained to be about one second. Before the end of the first second of sintering at 1400 C following the preliminary heating up period, tensile strengths of more than 6 kg per sq mm are reached. In ordinary practice, such values could only be obtained after a prolonged sintering period. With this test equipment, the powder particles are sintered together almost instantaneously and as a result it is possible to perform this process much more rapidly than has been thought feasible. Such short sintering time also permit the use of short sintering furnaces in equipment setup for continuous operation.

Strip produced from RZ powder and sintered in this fashion showed no considerable reduction in volume, nor was this reduction greater than that occurring in sintered and pressed rings. Those metal powders produced by mechanical or chemical means did show more or less considerable sintering contraction, depending on the individual particle size and the pressing pressure applied.

In Part II, to appear soon, cold-rolling and annealing experiments are described and the results of deep drawing tests are given. The making of steel strip is discussed, together with present and possible future costs of iron powder.—Ed.

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SPECIAL SCALE aids piston rod balancing

FIG. 2—Front of the Buick rod weighing machine with a rod in place and most of housing removed. Dial divisions are uniform. Sensitive dashpots in foreground make the scale dead beat.

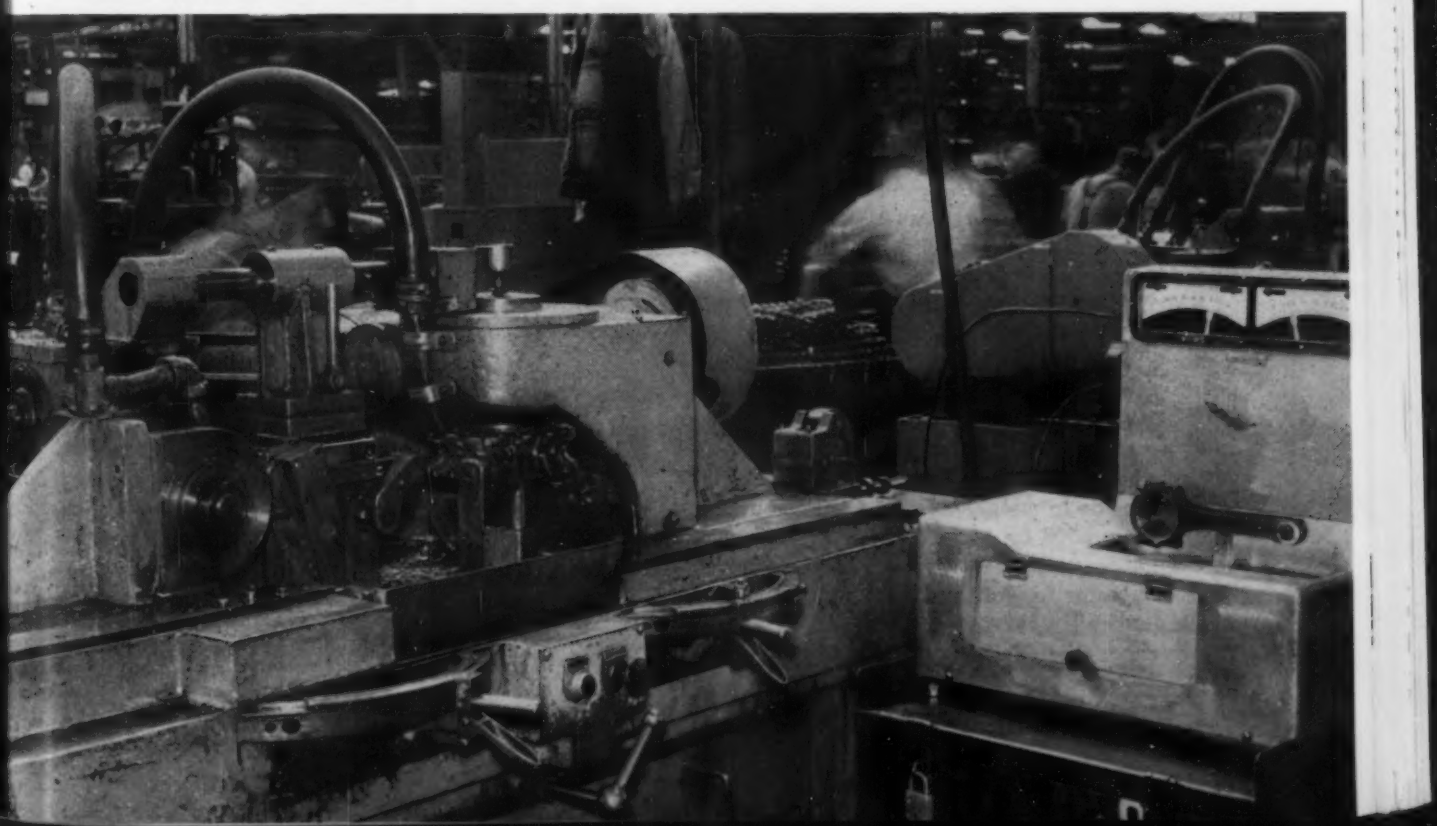
To minimize engine vibration, G.M.'s Buick Motor Division exercises unusual care in weighing and balancing connecting rods employed in its Fireball engines. Each end of each rod has to come within ⅛ oz of standard weight. If weight at either end is excessive, metal has to be machined from bosses left at both ends to permit close balancing. Fig. 1 shows one of the new scales that Buick has developed to expedite weighing and insure holding the precise weights specified.

Each rod is set with its big end over two pins and its small end over a single pin of the weighing machine. Corresponding pointers move over two dials having 1/16-oz graduations and the pointers come to rest almost instantly because, although the scales are unusually sensitive, a suitable dashpot system makes the scales dead beat.

If readings do not come initially within the limits set, machining is done in the milling machine at left in Fig. 1. This machine has a fixture that holds the rod from the bores at each end. The amount of metal removed from each end depends upon the setting of two levers, each movable over a quadrant. Graduations on the quadrants correspond with those on the weighing scale and the levers are set to the reading that the respective scale pointers give. When this is done and the rod is in the fixture, the machine makes the corresponding cuts automatically. Then the rod is reweighed to be sure that cuts bring weights at both ends within the required limits.

In Fig. 2 the scale is shown with most of its housing removed to reveal the mechanism that Buick engineers developed to meet weighing needs. This development was undertaken because commercial scales previously employed had several drawbacks. These commercial scales

FIG. 1—New rod weighing scales developed by Buick, right. At left, the milling machine employed to remove excess metal when rods are found out of balance. Levers moving over quadrants in front of the machine are set, according to scale readings, to bring about correct balance.



Special scale

Continued

lacked desired sensitivity and accuracy, did not have uniform graduations, and required overhaul and recalibration each one to three months. Moreover, if rods weighed were unduly heavy on one end, readings on the other end became inaccurate.

With the new scales, all these disadvantages are overcome. This is accomplished both through better design and through better construction. Indications involve only angular displacement of levers and counterweights and no steel tapes are required. The leverage system differs considerably from that of commercial scales. Knife edges are of hardened steel and the primary ones bear on tungsten carbide blocks while agate bearings are used with sector knife edges. If one end of the rod has excessive weight, weight indications on the other dial are not affected. Dials on which the graduations appear are adjustable and dial divisions are uniform. Preloading of dial hands is effected by counterweights but these weights, when properly adjusted, are so disposed that their deflection does not adversely affect the accuracy of readings.

Because of these features, the scales stay in adjustment. Some have been in use for more than a year without needing recalibration. This, of course, saves labor besides avoiding the uncertainties and need for frequent checking that were necessary with scales formerly used. When, to these advantages are added those of more rapid and precise weighing, the investment involved in designing and building the new scales is considered fully justified.

Checks hardness

'ON-THE-JOB'

Readings of metal hardness may now be taken any place in a plant or warehouse in a matter of seconds. It is done with a 30-oz, palm-sized hardness tester, made by Snow, Deakin and Co., Ltd., England, and distributed in this country by Newage International, Inc., New York. The device has been used to measure the hardness of flat, curved, round and other shapes. Sheet metal as thin as 0.020 in. has also been successfully tested.

The Ernst portable hardness tester is operated by pressing down the handgrips on the sides of the instrument. The unit's indentor is then actuated by a helical spring exerting a constant load of 15 lb. As the indentor or point penetrates the metal, it also compresses the base of a liquid-filled chamber, causing the liquid to move into a capillary tube. The tube extends up and around the tester's dial, and the point at which the liquid stops flowing represents the particular metal's hardness. Penetration of the metal is magnified 3000 times by the displacement of the liquid into the capillary tube.

Best results are obtained with the device by applying static pressure rather than by the sudden application of force. Only small indentations are made in metal surfaces, their maximum depth being 0.003 in. and maximum width 0.006 in. A hardened steel conical point is used with the Ernst tester for soft and medium hard metals and a diamond point for extremely hard alloys. The liquid in the capillary tube is colored green to facilitate reading and it contains antifreezing salts in solution.

The circular scales on which readings are made are interchangeable. Calibrated scales for Brinell, Rockwell, diamond pyramid or tons tensile are available.

THE ERNST PORTABLE hardness tester may be used to check the hardness of metals and alloys on the assembly line, in the warehouse and other such "on-the-job" points. Metals of a wide range of shapes and sizes may be tested with this device.

news of industry

Steel Capacity in '52 Set at Over 120 Million Tons

Industry's greatest growth spree . . . Pittsburgh-Youngstown still on top . . . But East takes second place from Chicago . . . Estimate includes Barium's eastern mill—*By John Delaney.*

Pittsburgh—The steel industry is on the greatest expansion spree in its history. Annual ingot capacity probably will exceed 120 million tons by the end of 1952, or shortly thereafter.

The expansion picture is changing so rapidly that steel marketing experts are at wit's end trying to put the pieces together. Some programs are still to be announced. Those that have been are likely to be on the conservative side.

When the last rivet is driven home, the industry's competitive map will be largely redrawn.

On the basis of announced programs and others known to be under consideration, the Pittsburgh-Youngstown district will retain the No. 1 spot with a probable capacity of more than 43.6 million ingot tons. However, the East will replace Chicago in the runner-up position with 28 million tons as compared with close to 24 million tons. Cleveland-Detroit capacity will be 14 million; the West 6.4 million and the South 5.6 million. This totals about 121.5 million, an increase of 22.1 million tons over capacity at Jan. 1, 1950.

This estimate includes U. S. Steel Corp.'s new mill at Morrisville, Pa. (1.8 million tons); National Steel Corp.'s planned mill at Paulsboro, N. J. (estimated 1.5 million tons); Barium Steel Corp.'s mill now under consideration (1.3 million tons), and the New England mill (estimated 1.0 million tons). It also includes Gibraltar Steel Corp.'s mill (estimated 800,000 tons).

A survey by the American Iron & Steel Institute indicates that blast furnace capacity at Dec. 31,

New Steel Capacity Planned by Producing Districts

PITTSBURGH—A geographical breakdown of contemplated steel capacity increases by Dec. 31, 1952, including probable new capacities by producing districts:

District	Cap. at Jan. 1, 1950 (N.T.)	Probable Increase (N.T.)	Probable cap. at Dec. 31, 1952 (N.T.)
Pgh.-Youngstown	39,145,920	4,502,700	43,648,620
East	19,875,460	8,130,000	28,005,460
Chicago	20,777,520	2,994,900	23,772,420
Cleveland-Detroit	9,333,460	4,752,000	14,085,460
West	5,699,620	725,000	6,424,620
South	4,560,820	1,054,600	5,615,420
Totals	99,392,800	22,159,200	121,552,000

Stopgap Wage-Price Freeze

Washington—A stopgap wage-price order fell on industry, freezing nearly all commodities and services, except most farm products, at highest levels in a base period from Dec. 19, 1950, to Jan. 21, 1951. Wages were chilled at Jan. 25 levels. Lengthy adjustment on these hasty orders is coming. (See p. 128 for complete story.)

President Truman has signed an executive order calling on government agencies to lend personnel to the Office of Price Stabilization to aid in enforcing the price freeze.

Gary Coke Battery Enlarged

Gary—Reconstruction of the No. 13 coke oven battery of the United States Steel Co.'s Gary works was completed recently. The battery, enlarged from 69 to 77 ovens, will increase annual coke production from 340,000 to 380,000 tons. A similar project underway on the company's No. 15 coke oven battery is expected to be completed by July of this year.

Cole Named to NPA Steel Div.

Washington — Melvin W. Cole, Bethlehem Steel official, has been appointed deputy director of NPA Iron and Steel Div. Mr. Cole headed the Iron and Steel Div. of the Office of Industry Cooperation during the time of voluntary allocations in 1948. He also served with the WPB for 3 years during World War II.

1952, will be close to 80 million tons, an increase of more than 7 million tons over Jan. 1, 1951 capacity.

This tremendous program has been spurred by three factors: (1) The opportunity of amortizing part of the cost over 5 years for tax purposes; (2) the defense effort, and (3) encouraging results of market studies on the long-range demand for steel.

In addition to materials and equipment for the expansion itself, the industry must provide for greatly expanded raw materials requirements, such as iron ore, coal, limestone, manganese, scrap, gas, fuel oil, and electrical power. More than 150 million tons of iron ore alone will be needed to support capacity operations—30 million tons more than the estimated consumption last year.

Steel Capacity Expansion Plans

(By Company and Location—Jan. 1, 1950 to Dec. 31, 1952)

Pittsburgh—Indications are that steel industry annual ingot capacity will exceed 120 million tons at Dec. 31, 1952. This is the expansion picture, based on latest information available at press time. Capacity increases are in relation to capacity at Jan. 1, 1950 of 99,392,800 tons.

Company	Planned Cap. Inc.* from Jan. 1, '50 to Dec. 31, '52 (Net Tons)	Location
U. S. Steel Corp.	1,064,700	Pittsburgh District
	456,900	Chicago District
	140,000	Youngstown District
	1,800,000	Morrisville, Pa.
	500,000	Fairfield, Ala.
	160,000	Geneva, Utah
Bethlehem Steel Corp.	1,080,000	Lackawanna, N. Y.
	740,000	Sparrows Point, Md.
	352,000	Steelton, Pa.
	188,000	Bethlehem, Pa.
	180,000	Johnstown, Pa.
	60,000	Los Angeles, Cal.
National Steel Corp.	1,200,000	Ecorse, Mich.
	300,000	Weirton, W. Va.
	1,500,000**	Paulsboro, N. J.
Armco Steel Corp.	580,000	Middletown, O.
	150,000	Houston, Tex.
	150,000	Kansas City
	137,000	Ashland, Ky.
	6,000	Butler, Pa.
Jones & Laughlin Steel Corp.	1,200,000	Pittsburgh
	350,000	Cleveland
Youngstown Sheet & Tube Co.	925,000	Indiana Harbor, Ind.
Republic Steel Corp.	852,000	Cleveland District
Inland Steel Co.	750,000	Indiana Harbor, Ind.
Detroit Steel Corp.	720,000	Detroit
Granite City Steel Co.	620,000	Granite City, Ill.
Sharon Steel Corp.	560,000	Farrell, Pa.
Pittsburgh Steel Co.	488,000	Monessen, Pa.
Colorado Fuel & Iron Corp.	325,000	Pueblo, Colo.
	40,000	Buffalo, N. Y.
Crucible Steel Co.	300,000	Midland, Pa.
Wheeling Steel Corp.	264,000	Wheeling, W. Va.
Kaiser Steel Corp.	180,000	Fontana, Calif.
McLouth Steel Corp.	100,000	Trenton, Mich.
Atlantic Steel Co.	100,000	Atlanta, Ga.
Allegheny-Ludlum Steel Corp.	80,000	Watervliet, N. Y.
Timken Roller Bearing Co.	75,000	Canton, O.
Alan Wood Steel Co.	50,000	Conshohocken, Pa.
Continental Steel Corp.	36,000	Kokomo, Ind.
Laclede Steel Co.	35,000	St. Louis, Mo.
Green River Steel Co.	30,000**	Owensboro, Ky.
Tennessee Steel Corp.	100,000	Oneida, Tenn.
Connors Steel Div. of H. K. Porter Co.	37,600	Birmingham, Ala.
Empire Steel Corp.	75,000	Mansfield, O.
Keystone Steel & Wire Co.	22,000	Peoria, Ill.
New England Mill	1,000,000**	New London, Conn.
Barium Steel Corp.	1,300,000**	Phoenixville, Pa.
Gibraltar Steel Corp.	800,000	Detroit
Total	22,159,200	

*At least 4,836,850 net tons of this capacity is already in production. This includes 1.6 million tons of new capacity added by U. S. Steel last year and 1 million tons added by Bethlehem.
**Estimated

New Gibraltar Steel Corp. Plans Detroit Integrated Mill

Detroit—The newly-formed Gibraltar Steel Corp. is planning to build a new integrated steel mill of 800,000 tons annual capacity near Detroit. It will cost more than $100 million. Building of the plant is contingent on a large Reconstruction Finance Corp. loan. Detroit Steel Corp. also filed a certificate of necessity for steel expansion but details were not available at press time.

The plant would be located on a 900-acre tract on the Detroit River at Trenton, Mich., about 17 miles from Detroit. Backers of the project say it can be completed in 18 months if priorities are granted.

Steelmaking facilities would include a coke oven battery and blast furnace, four openhearth furnaces, blooming mill and hot and cold-rolled sheet mill. Finished steel capacity would be about 675,000 net tons of hot and cold-rolled sheet and strip.

Present plans call for an initial outlay of $10 million of private funds and a $90 million RFC loan. An additional $5 million of private funds would be raised when the plant is in operation. A certificate of necessity will be sought.

Cyrus Eaton, Cleveland financier head of Otis & Co., will be Gibraltar chairman of the board. Max Zivian, president of Detroit Steel Corp., will be president; and Carlton M. Higbie, president of Higbie Mfg. Co., will be vice-president and chairman of the executive committee.

Lone Star Steel's New Plant To Produce 350,000 Tons of Pipe

Dallas—Backed by a $73,425,201 loan from three government agencies (THE IRON AGE, Jan. 18, 1951, p. 95) construction of its integrated mill near existing facilities is being pushed by the Lone Star Steel Co. Ground breaking was to start "at once."

Planned are four openhearths with an average heat of 188 tons

each. Rolling mills will be built with future expansion in mind. A two-high plate mill will produce plates measuring 44 in. by 110 in. A Steckel mill will further reduce plate thickness and roll the steel into coils. After feeding through forming stands, the coils will be electrically welded into tube.

Estimated output of the proposed plant is 500,000 tons of steel ingots to make 350,000 tons of welded steel pipe in diameters from 2 in. to 16 in.

Boron Steel Seen Substituting for Some Alloys

Changing alloy steel specs signal greater reliance on boron-containing steels . . . See autos, trucks, machinery, oil country goods hardest hit . . . Alloys short—*By Walter Patton.*

Detroit — Alloy steel specification changes already made and under consideration indicate that boron-containing steels will be used in large quantities by the end of this year. Although there may be important exceptions, through-hardened, boron-treated steels may replace many of the alloy steels containing chromium, nickel and molybdenum as alloying elements.

Products most likely to be affected, say metallurgists here, are automobiles and trucks, certain types of military combat vehicles, machinery, and oil country goods.

Aircraft alloy steels will be changed less rapidly than other required steels, but even these may have to give way if all-out war production is ordered by Washington.

Not Much Choice

"There is little choice left to us," a prominent Detroit steel buyer told THE IRON AGE this week. An all-out jet engine program would undoubtedly swallow up a very large percentage of all available chromium, molybdenum and nickel for steel alloying purposes."

The critical alloy shortage is developing for several reasons. Government stockpiling of nickel, molybdenum, tungsten and other alloying elements has been extensive. The stockpiling program is likely to continue and may even be enlarged, some believe.

In addition, military vehicles need a much larger percentage of alloy steel. Sections involved are large, requiring high hardenability which usually means higher alloy content. In normal times, perhaps 7 pct of all constructional steel production is alloy. The percentage of total bar steel carrying alloy today is nearer 10 or 12 pct.

Used Widely During War

U. S. metallurgists have had wide experience with boron-treated steel. Such steels were used extensively during World War II. Most grades have been thoroughly tested in the laboratory and in service. Since World War II, some firms have continued to use boron-treated steels. Caterpillar Tractor Co. and Mack Truck Co. are examples. Many laboratory tests of boron-treated steels were run by Buick at Flint even prior to 1940.

Most automobile companies have made or are making studies to determine the extent to which boron-treated steels can be substituted for conventional SAE grades. In addition, committees of the Society of Automotive Engineers are studying both civilian and military alloy steel problems. A study of army jeep specifications has already been completed. Examination of the prospects for using boron-treated steels for army combat vehicles is in process.

Applied to Large Parts

Generally speaking, boron-treated steels have been most widely applied to large parts, requiring deep hardening. Although many tests have been made on carburizing grades having a hard, high carbon case and a soft core, service experience on these grades has been limited. The problem of possible distortion of boron-treated steels during heat treatment will require further study, say Detroit metallurgists.

Most Detroit engineers and metallurgists, remembering their successful experience during World War II, will approach the possibility of changing over to boron-treated steels with an open mind. Traditionally, the Air Corps has resisted such changes, insisting on steels with high chromium, nickel and molybdenum content.

Tungsten Cutting Tools

Another development in alloy steels is rapidly becoming a major headache for Detroit production experts. Drastic reduction in the use of tungsten cutting tools will result in widespread changes in tool specifications, it is believed. While many car companies have already changed over either to carbides or molybdenum-type steels, recent changes in the tungsten quota are expected to be felt in Detroit.

Restrictions on cobalt may result in further deviations in plant cutting tool practice.

Molybdenum Restrictions

Washington—NPA last Saturday ordered a temporary freeze on all non-rated orders for molybdenum except for making high-speed steels. At the same time, NPA issued an order (M-33) restricting molybdenum inventories to a 20-day supply.

Also, in another move, NPA issued directives by letter to producers, handlers, and marketers of molybdenum ordering that only 50 pct of the amount ordered on both rated and non-rated orders for high-speed steels be delivered.

INDUSTRIAL SHORTS

NCA OFFICERS—J. F. Pritchard, president of J. F. Pritchard & Co., Kansas City, has been elected president of the NATIONAL CONSTRUCTORS ASSN. J. J. O'Donnell, manager of personnel and labor relations of the Lummus Co., New York, was chosen vice-president.

PONTUSCO CORP. — Complete ownership of Pontusco Corp., has been acquired by the U. S. PIPE & FOUNDRY CO., Burlington. Pontusco formerly was jointly owned by U. S. Pipe & Foundry Co., and Compagnie de Pont-a-Mousson of Nancy, France.

GOLDEN JUBILEE — THE BUCKEYE BRASS & MFG. CO., Cleveland, manufacturer of bearing bronze, announces its fiftieth year of service to the industry.

COKE IS COOKING—ARMCO STEEL CORP. has awarded a contract to the Wilputte Coke Oven Div. of Allied Chemical & Dye Corp. for the erection of a coke oven plant at Middletown, Ohio. The new plant will have 76 coke ovens, and should have an annual capacity of 450,000 tons of blast furnace coke.

IN BUSINESS—G. G. GREULICH, formerly consulting engineer, Special Products Div., U. S. Steel Co., has opened an office at 610 Dupont Circle Bldg., Washington. He will represent Drilled-In Caisson Corp., W. E. O'Neil Construction Co., and Western Foundation Co.

NEW LOCATION—A new warehouse and general office building located in Cambridge, has been opened by WARD STEEL CO.

EXPANSION PROGRAM — A $500,000 expansion program including additional equipment and instruments to increase the availability of basic ingredients for company products was announced by KENNAMETAL, INC., Latrobe, Pa.

JOIN FORCES — The Baker-Raulang N. Y. Corp. and the Material Handling Equipment Co. have joined forces and will be known as MATERIAL HANDLING EQUIPMENT CO., located at 141 E. 44th St., New York.

MAKING COR-TEN — The ACME STEEL CO., Pittsburgh, has been licensed to manufacture Cor-Ten, corrosion resistant, high strength, low alloy steel developed by Carnegie-Illinois Steel Corp.

INCREASES OUTPUT—A new alumina plant will be built near Bauxite, Ark., by the ALUMINUM CO. OF AMERICA. The new plant will be operated by Aluminum Ore Co., wholly-owned subsidiary of Aluminum Co. of America, and will increase production 50 pct.

ACQUISITION—The Pittsburgh Valve & Fittings Div. of the Pitcairn Corp., Barbeton, Ohio, and the Pittsburgh Valve & Fittings Corp., a subsidiary of the Pitcairn Corp., has been acquired by ROCKWELL MFG. CO., Pittsburgh. Rockwell paid approximately $3 million for the purchase.

DISTRIBUTOR — Worthington Pump & Machinery Corp., Harrison, N. J., has named the HUTCHINSON FOUNDRY & STEEL CO., Hutchinson, Kan., a distributor for their construction equipment, including mixers, placers, air tools, centrifugal pumps and suction and discharge hoses.

MERGER—Crescent Truck Co., Lebanon, Pa., manufacturers of electric industrial trucks and tractors, has merged with BARRETT-CRAVENS CO., Chicago, and will operate as a division of the company. All sales will be conducted from the general office of Barrett-Cravens in Chicago, and manufacturing operations will continue at Lebanon.

NPA Nickel Order Amended To Ban Use in Non-Defense Items

Doesn't alter first quarter limits . . . More than 300 items in ban.

Washington—Nickel order (M-14) was amended last week to prohibit use of nickel bearing metals in a wide variety of non-defense products.

The order exempts purely functional uses if there is no suitable substitute. Some types of repair are permitted. The amendment does not change original first quarter limits of non-defense use of nickel to 65 pct of the base period average.

Ban Effective Apr. 1

Specifically, the order now provides that after Mar. 1 no nickel silver or nickel plate can be used in making the listed items. The effective date of the ban on high nickel alloys and nickel bearing stainless steel is Apr. 1.

A period of grace is allowed for items already in process before the effective dates of the order. Such work must be completed within 2 months after those dates.

More than 300 items under about 20 general classifications are prohibited under the amended order. Particularly affected are the automotive, construction, hardware and appliance industries.

Use of stainless steel in making most farm machinery, implements and tools is out, as well as for automobile bumpers, hubcaps and numerous other items. It is also banned for many uses in construction, appliance manufacture, general and miscellaneous purposes.

Essential Uses Only

Nickel alloy is banned for a variety of building materials, appliances, dry cleaning equipment, motor vehicle accessories, jewelry, and miscellaneous purposes. Use of nickel plate is prohibited for numerous hardware, appliance, furniture, auto accessories, and other categories.

Use of nickel silver is prohibited outright for all uses except dairy equipment, drafting and engineer-

ing instruments, hospital equipment and orthopedic appliances, slide fasteners, flat and hollow ware (not over 15 pct nickel), watch cases (not over 10 pct), and functional purposes for springs and communications and electrical equipment parts.

New Specs for Furnace Group Sought to Ease Nickel Shortage

Washington — Standardization of types and rewriting of heat treating furnace specifications are being urged by the industrial furnace and oven industry's advisory committee to NPA in an effort to help obtain scarce nickel and other materials.

The NPA has amended the nickel order (M-14) banning some end uses of nickel and is drafting an order controlling nickel scrap. The agency is also considering an MRO order for the furnace industry.

The industry is already using nickel substitutes wherever possible. But because of material shortages backlogs continue to grow. Orders have more than doubled the July level.

Canadian Iron Ore to England

Montreal—Dominion Steel & Coal Corp. has signed a 5-year contract to sell iron ore to Great Britain starting in 1952. The agreement covers annual shipments of 1 million gross tons, which will be supplied by the company's subsidiary, Dominion Wabana Ore, Ltd., Bell Island, Newfoundland. Additional mining, loading and shipping facilities at a cost of $6,000,000 will be built at Wabana.

GE Turbine Output Sets Record

Schenectady — Production of large turbine generators by the General Electric Co. during 1950 surpassed all company records. In the first full year of operation at the Schenectady plant combined capacity of units made totaled 2,866,000 kilowatts. Largest steam generator made had a rating of 165,000 kilowatts.

Shell Steel Mill Percentage Limits Abolished

NPA to quicken output of shell quality hot-rolled bars, billets, armor plate . . . Orders no longer DO's, subject to NPA negotiation . . . Bookings were extended—*By Gene Beaudet.*

Chicago — The recent government order revising certain provisions of NPA order M-1 indicates that the priority system of placing defense orders with steel mills is starting to collapse under its own weight.

With this revision hot-rolled bars of projectile or shell quality steel are lifted out of the DO category entirely and are subject to direct negotiation with NPA if necessary. It abolishes percentage limits over which mills are not required to book these items. It also applies to billets of projectile or shell quality and rolled armor plate.

Speculation on Reasons

Why such an order was issued is open to speculation. Some cold-drawn producers who are experiencing difficulty placing DO shell orders claim it is because DO bookings on these items are extended so far out that they cannot be filled in a reasonable length of time to satisfy contractors production schedules.

To fill these orders some cold drawers have been taking their consumer hot bar mill allotments in shell quality grades and getting them filled more quickly. They have then taken their DO tonnage in a common grade of hot-rolled bars and used them to replenish inventory or fill non-DO orders.

Some think mills have not put enough production into shell quality steels because they need a lot of conditioning, take away from other production, and are not as profitable as other grades. Others believe that they were not produced because there weren't enough shell orders out to justify increased production of these items until recently. Shell orders were scarce from August to November last year.

In December they picked up, continued to mount, and are expected to become even greater. As a result, mills were caught short. Some big bar mills in the area are presently booked into next December on defense orders, while others in the East are reported to be booked anywhere from September to January 1952.

Opening Up Bottleneck

To alleviate this bottleneck, NPA threw shell order bookings wide open. No DO limit was authorized because there was not enough shell steel being produced and therefore, no matter how high the percentage was raised there would not be enough. As shell orders increase they will be just absorbed by the mills. Procedure is not yet clear. Some mill sources believe they will receive NPA directives ordering them to produce certain tonnages of shell steels each month. Others think that holders of shell orders will place the orders with the mills. If they are unable to get them filled they will then apply to NPA which will direct certain mills to fill the order.

Controls—Contracts

Two new regular weekly service features have been added by The Iron Age.

"Controls Digest" is a quick reference list of government orders and regulations relating to the metalworking industry and will be carried each week to help you keep abreast of latest government rulings. See page 126.

"Defense Contracts to Metalworking Industry" brings you selected major contracts awarded each week by government agencies. Potential sub-contractors will find the list on page 128 especially useful."

Expansion Rise to 6 Million Tons by '52 Listed by National

Pittsburgh — National Steel Corp.'s annual ingot capacity will rise to 6 million tons during 1952 —an increase of 500,000 tons over earlier announcements of expansion plans.

E. T. Weir, chairman, said that further developments in the company's flexible expansion program were responsible for the upward revision. The 1952 capacity will represent an increase of 1,500,000 tons over 1950 capacity. Present capacity is 4,750,000 tons.

This does not include the company's planned eastern mill at Paulsboro, N. J., which will have a capacity of approximately 1,500,000 tons.

When the program is completed, Great Lakes Steel Corp. capacity will be 3,600,000, an increase of 1,200,000 tons, and that of Weirton Steel Co. will be 2,400,000 tons, a boost of 300,000 tons.

Named to NPA Abrasive Group

Chicago—Arthur T. Dalton, secretary of Chicago Wheel & Mfg. Co., has been appointed to the advisory committee for the abrasive industry of the National Production Authority. During World War II Mr. Dalton was a representative on the abrasive advisory group of the War Production Board.

Amend Aluminum Scrap Order

Washington—The National Production Authority has postponed the effective date of the aluminum scrap order (M-22) until Mar. 1. The action was taken in order that additional firms could be included in the list of eligibles for processing scrap.

CONTROLS *digest*

For more details see "You and Government Controls," The Iron Age, Jan. 4, 1951, p. 365. For full text of NPA regulations write U. S. Dept. of Commerce, Division of Printing Service, Room 6225 Commerce Bldg., Washington 25, D. C.

Subject	Order	Effective Date
General		
Inventory Control	NPA Reg. 1	Sept. 18
	Interpretation 1, 2, 3	Nov. 10
Priorities System	NPA Reg. 2	Oct. 3
DO Ratings	Amend. 1, 2	Oct. 3, Dec. 29
DO Ratings	Delegation 1, 2, 3, 4	Nov. 1, Nov. 2, Nov. 3
Priorities (Canada)	NPA Reg. 3	Nov. 8
Auto Prices, Wages	ESA Reg. 1	Dec. 18
Hoarding	NPA Notice 1	Dec. 27
Metals		
Aluminum distribution	NPA M 5	Oct. 27
Aluminum cutback	NPA M 7 (amended)	Dec. 1
	Direction 1	Nov. 28
	Direction 2	Dec. 16
	Direction 3	Dec. 27
Aluminum scrap	NPA M 22	Mar. 1
Cadmium	NPA M 19	Jan. 1
Cobalt stocks	NPA M 10 (amended)	Dec. 30
Collapsible tubes	NPA M 27	Jan. 27
Columbium steels	NPA M 3	Oct. 19
Copper distribution	NPA M 11	Nov. 29
Copper use	NPA M 12 (amended)	Dec. 30
Copper scrap	NPA M 16 (amended)	Jan. 1
Molybdenum cutback	NPA M 33	Jan. 27
Nickel cutback	NPA M 14 (amended)	Jan. 23
Ores, metals	NPA Del. 5	Dec. 18
Steel	NPA M 1 (amended)	Jan. 22
Freight car program	Supl. 1	Oct. 26
Great Lakes ships	Supl. 2	Nov. 15
Canadian freight cars	Supl. 3	Dec. 15
Steel warehouses	NPA M 6 (amended)	Nov. 15
Tin inventories	NPA M 8	Jan. 9
Tinplate, terneplate	NPA M 24	Jan. 27
Metal cans	NPA M 25	Jan. 27
Tinplate closures	NPA M 27	Jan. 27
Tungsten	NPA M 30	Jan. 22
Zinc distribution	NPA M 9	Nov. 16
Zinc cutback	NPA M 15	Jan. 15
Miscellaneous		
Chemicals	NPA M 32	Jan. 23
Construction	NPA M 4	Oct. 27
	Amendment 1, 2	Oct. 13, Nov. 15
Elec. components	NPA M 17	Dec. 18

Zinc Industry Asks 60 Day Halt on Changes in NPA Order M15

Washington—Spokesmen for the zinc industry last week requested the National Production Authority to make no changes in the zinc order (M-15) over the next 30 to 60 days.

Both zinc producers and users believe the present unbalanced stocks and maldistribution has been caused primarily by attempts of users to bring inventories up to something near the permitted levels. Both groups think the situation will straighten itself out.

Zinc users told NPA they were opposed to any drastic limitation of end uses for fear of having to shut down. They said that many suppliers are filling rated orders out of regular stocks and are forced to hold nondefense allotments far below the 80 pct level imposed by M-15.

NPA Assigns Aluminum Authority

Washington — NPA authority has expanded its delegation of authority to the Secretary of Defense so as to permit rescheduling of deliveries of aluminum forms for the aircraft and guided-missiles program.

This will not affect production schedules. It merely permits an aluminum delivery to be shifted from one manufacturer to another when it is necessary to speed up either program.

NPA Readies Steel Strapping Order; Will Survey Metal Plants

Washington—The National Production Authority is preparing an order which will greatly restrict use of steel strapping in nonessential packaging. Industry spokesmen feel such an order is necessary.

Meanwhile, NPA has started a survey of metal consuming plants to get a better picture of how much material is going into various metal products.

Such information is needed to

set up a maintenance, repair, and operations program and orders, fast becoming necessary. Also the information provides more data for reviving the controlled materials plan now in the works.

Two industries—warm air heating and steel strapping—have already started task groups to provide data. The strapping industry expects to have first half requirements worked out when its advisory committee reconvenes with NPA on Feb. 12.

Bill Seeks U. S. Redress on Excessive Profits

Passed by House, now weighed by Senate, measure seeks recapture of excessive profits on war contracts . . . Would give 5-man board power to reopen, renegotiate contracts.

Washington—Senate tax-writers began this week to consider House-passed legislation permitting the government to recapture "excessive profits" on war contracts by renegotiation.

Rep. Doughton, D., N. C., who steered the renegotiation bill through the lower house to a 377-0 vote, said such a statute was necsary to protect the government against hasty cost estimates provided by contractors and subcontractors.

Board Can Reopen Contracts

The bill provides for a 5-man renegotiation board with authority to reopen contracts entered into by government agencies concerned with defense production. But a contractor or subcontractor must have received more than $100,000 in any one year before any of his contracts may be renegotiated.

The act is to become effective January 1, 1951, and affects all contracts entered into by the Depts. of Defense (including Army, Navy, and Air Force) and Commerce; the General Services Administration; Atomic Energy Commission, and any other agencies concerned with defense procurement.

Some Fields Exempt

Subcontractors whose income is derived from fees or commissions would be subject to the new act for any year in which they have receipts of $25,000 or more.

Exempt from renegotiation are agricultural commodities, timber, and products of mines and oil and gas wells.

The bill provides for payment of 6 pct interest by the government in the case of recapture of funds, and 6 pct by the contractor or subcontractor from the date the government decides additional sums are payable by the contracting firm.

The act would replace any existing law passed in 1948 under which only military contracts are subject to renegotiation. The House Ways and Means Committee said this act was inadequate to safeguard the government in a time of huge defense expenditures.

"Now that I'm an executive, there are several young ladies at the office trying to take me away from you."

Plea for Higher Lead Import Levy Rejected by Tariff Group

Washington—An application filed by the Emergency Lead Committee and the New Mexico Miners & Prospectors Assn. requesting an investigation of, and increased levies on, imports of lead from Mexico has been dismissed by the Tariff Commission.

With termination of the Mexican Trade Agreement on Dec. 31, import rates which had been cut in half under the agreement have automatically returned to the 1930 rates. These duties are now 1½¢ a lb (lead content) for ores, flue dust and mattes; 2⅛¢ per lb on lead bullion, pigs, bars, scrap, and reclaimed lead.

Wright Calls for Subcontractors

Wood-Ridge, N. J.—Wright Aeronautical Corp. has sent out a call for subcontractors to make parts for America's warplanes. Most urgently wanted are firms with facilities to produce: hardened and ground parts (carburizing and nitriding facilities preferred); fabricated sheet metal—stainless steel (press and certified welding equipment required); gears; screw machine products; aluminum, magnesium, and steel castings, raw and finished; aluminum forgings, raw and finished; controls and accessories; and engine sub-assemblies.

Galvanized Ware Standards

Washington—Minimum grades for galvanized ware fabricated from pregalvanized sheets, as proposed by the Galvanized Ware Mfrs. Council have been published as Commercial Standard 169-50, according to the Dept. of Commerce. Copies are available from the Government Printing Office.

Scaife Gets Big Shell Contract

Pittsburgh—Scaife Co., Oakmont, Pa., has signed a $6 million Army contract for production of mortar shells. The job will not hinder the company's normal production of pressure vessels.

Stopgap Wage-Price Frost Falls on Industry

Steel prices stay under voluntary plan . . . Nearly all products, services frozen at highest levels, Dec. 19 to Jan. 25 . . . Rollbacks, flexible wage policy coming—*By Gene Hardy.*

Washington — The American businessman this week is confronted with two government orders that will have a profound effect on his method of operation for a long time to come. Putting into effect the first price and wage controls since the end of World War II, the Economic Stabilization Agency describes the new orders as stopgap measures.

The General Ceiling Price Regulation freezes prices for practically all commodities and services, except most raw farm products, at the highest levels prevailing during the base period Dec. 19, 1950, to Jan. 25, 1951. General Wage Stabilization Reg. 1 freezes all "wages, salaries and other compensation" at Jan. 25 levels, with new employees to be paid at the rates in effect Jan. 25.

Affecting all business, producing and distributing, the orders will be replaced as soon as possible with specific mark-up and dollars-and-cents ceilings and a flexible wage policy. Price Stabilizer M. V. DiSalle says that plans for a price rollback were dropped since this would have delayed the freeze order for several weeks. Coming specific orders, however, will involve some rollbacks.

A more flexible wage policy is expected from Wage Stabilization Board Chairman Cyrus Ching sometime this week. It will probably sanction at least a 10 pct boost in wages above mid-1950 levels.

ESA officials are also working to close loopholes in the hastily drawn orders; provide relief in hardship cases; and provide for industries which voluntarily set price ceilings below those required by the freeze order.

Steel Under Voluntary Plan—Steel prices are not covered by the general freeze, but are still subject to the terms of the voluntary agreement (THE IRON AGE, Jan. 25, p. 86) under which the steel industry agreed to stabilize prices at the highest levels prevailing in the 30-day period preceding Jan. 15, 1951. Increases above the Jan. 15 level are not to be put into effect without giving ESA 20 days notice. ESA spokesmen told THE IRON AGE that the voluntary agreement is still the controlling factor in steel pricing under the exemption provided in Sec. 14 (q) of GCPR.

General Price Formula—GCPR sets the ceiling prices for all commodities and services, with the exception of raw farm products and the exemptions noted below, at the highest price for which the commodity or service was delivered during the base period to a purchaser of the same class.

For all practical purposes, this means the price prevailing on Jan. 25. If the commodity or service was not delivered during the base period, the ceiling is the highest price at which it was offered. The offer must have been made in writing, but in the case of a retailer it may have been made by display.

Commodities Not Sold in Base Period — Commodities not delivered or offered for sale during the base period, but which fall within a category dealt with in the base period are priced in a different manner. Ceilings for such commodities are worked out by applying to current direct unit cost the percentage mark-up currently being received on a "comparison commodity," i.e., one in the same category as the item being priced.

Different Categories — In the case of manufacturers producing commodities in a different category from any dealt with or services that cannot be priced on the basis of being offered or delivered, still another formula is contained in GCPR. The ceiling price in such cases is the same as the ceiling of the most closely competitive seller of the same class selling the same commodity or service to the same class of purchaser.

Prices set in this manner are final and not subject to redetermination, but can be disapproved by the Office of Price Stabilization. Manufacturers must report to the Director of Price Stabilization on

Defense Contracts to Metalworking Industry

Selected Contracts, Week of Jan. 29, 1951

Item	Quan.	Value	Company
Governor parts	6,118 ea.	$398,869	Int'l Spare Parts Corp., Long Island, NY
Trailers, Trucks	35,883	34,786,484	Fruehauf Trailer Co., Detroit
Buses	....	6,913,228	A.C.F. Brill Mtrs. Co., Philadelphia
Trailers	....	1,167,684	Linn Coach & Trk. Div., Oneonta
Axles	....	193,200	Chrysler Corp., Detroit
Kits	300	210,773	Perfection Stove Co., Cleveland
Tank engines, parts	....	40,000,000	Ford Motor Co., Detroit
Tank transmissions	....	65,000,000	General Motors Corp., Detroit
Vehicle parts	....	475,665	Federal Motor Truck Co., Detroit
Buses	602	6,847,610	ACF-Brill Motors Co., Philadelphia
Engine and parts	....	17,374,896	Continental Motors, Detroit
Strip, studs, etc.	30,585	467,661	Allis-Chalmers, Milwaukee
Parts	446,137	896,708	GMC United Motor Serv. Co., Detroit
Generators	4,070	328,856	United Motors Ser. Div. GMC, Detroit
Engines	600	914,250	Biederman Motor Corp., Cincinnatti
Trucks	....	1,076,862	Willys Overland Motors, Inc., Toledo
Engines	700	803,669	International Harv. Co., Detroit
Trucks, Fork, Electric	46	193,200	The Baker Raulang Co., Cleveland
Trucks, Fork, Gas	80	303,600	The Yale & Towne Mfg. Co., Philadelphia
Facilities for manufacture of Electric vehicles		4,994,485	Electric Auto Lite Co., Toledo
Vehicles		90,000,000	Chrysler Corp., Detroit
Vehicles		50,000,000	Chrysler Corp., Detroit

such pricing and cannot sell the commodity until 10 days after mailing the report.

Wholesalers may follow the same formula, but cannot begin selling the commodity until 30 days after mailing the report.

The regulation requires the following report from all sellers pricing in this manner:

"Your report should state the name and address of your company; the new categories in which the commodities fall and the most comparable categories dealt in by you during the base period; the name, address and type of business of your most closely competitive seller of the same class; your reason for selecting him as your most closely competitive seller; a statement of your customary price differentials; and, if you are starting a new business, a statement whether you or the principal owner of your business are now or during the past 12 months have been engaged in any capacity in the same or a similar business at any other establishment, and if so, the trade name and address of each such establishment. Your report should also include the following:

(1) **"If you are a manufacturer:** Your proposed ceiling price and the specifications of the commodity you are pricing; the manufacturing processes involved; your unit direct costs; and the types of customers to whom you will be selling.

(2) **"If you are a wholesaler:** Your proposed ceiling price and your net invoice cost of the commodity being priced; the names and addresses of your sources of supply, the function performed by them (e.g. manufacturing, distributing, etc.), and the types of purchasers to whom they customarily sell; the types of customers to whom you plan to sell; and a statement showing that your proposed ceiling price will not exceed the ceiling price your customers paid to their customary sources of supply.

(3) **"If you are selling a service:** Your proposed ceiling price and a description of the most comparable service delivered by you during the base period showing your present direct labor and materials costs and ceiling price for it."

Still Another Method — If a seller cannot determine his ceiling prices under any of the foregoing provisions, which, in the opinion of Mr. Di Salle, provide adequate pricing instructions for virtually all transactions, he may apply in writing to the Director of Price Stabilization for a ceiling price.

This application must contain an explanation of why the seller is unable to determine a ceiling price under other provisions of GCPR; all pertinent information describing the commodity or service, and the nature of the business; proposed ceiling price and the method used to determine it; and the rea-

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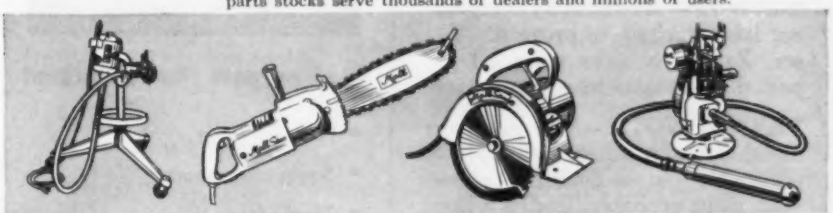

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- *Anti-slip even when oil-soaked*
- *Will not burn*

THE WYANDOTTE LINE

—all-purpose floor absorbent: Zorball; ***floor wax:*** Anti-Slip Wax; ***germicides:*** Steri-Chlor, Spartec; ***maintenance cleaners:*** Detergent, F-100, El-Bee, Paydet; ***detergent-sanitizers:*** Tri-Bac, Kromet — **in fact, specialized products for every cleaning need.**

WYANDOTTE CHEMICALS CORPORATION
WYANDOTTE, MICHIGAN
Service Representatives in 88 Cities

son it is believed the proposed price is in line with the level of ceiling prices otherwise established by GCPR. The commodity or service may not be sold until the seller is notified of the ceiling price.

Exports and Imports — Export and import sales are covered by the regulation. Importers handling commodities sold in substantially the same form, except for sorting, packaging, and simple processing, may adjust prices frozen at base period levels to offset an increase in landed costs since the base period, provided the commodities are covered by a contract date on or before Jan. 26, 1951.

Importers of crude and semi-finished steel, metal scrap, nonferrous metals, ferroalloys, minerals, and chemicals who reprice articles under this provision must file a report with the Director of Price Stabilization within 10 days after the first sale at the new price showing base period price, current foreign invoice price and total landed costs of commodities repriced.

Highest Price Line Limitation— Manufacturers of a selected list of consumer durables are also subject to a highest price line limitation. The list of items will be incorporated in a forthcoming supplementary order. This means that manufacturers of these commodities may not sell any of them at a price higher than the ceiling price for a commodity in that category.

For example: If the base period ceiling prices for a group of small "widgets" were $5.75, $6.75, and $8.75, firms will not be permitted to sell any "widgets" at a price in excess of $8.75.

Other Exemptions — Exempt from the order, in addition to the farm products affected by parity provisions, are most of the items which were exempt under OPA during World War II. These include: professional services, military and strategic commodities,

advertising, books and magazines, insurance rates, utility and common carrier rates, sales of used household or personal effects at bonafide auctions, and handicraft made by Indians and Eskimos.

Records Which Must Be Kept Under GCPR

Base period records.

(1) You must preserve and keep available for examination those records in your possession showing the prices charged by you for the commodities or services which you delivered or offered to deliver during the base period, and also sufficient records to establish the latest net cost incurred by you prior to the end of the base period in purchasing the commodities (if you are a wholesaler or retailer).

(2) In addition, on or before Mar. 1, 1951, you must prepare and preserve a statement showing the categories in which you made deliveries and offers for delivery during the base period; or if you sold services you must prepare and preserve a statement listing the services which you delivered or offered to deliver during the base period.

(3) On or before Mar. 1, 1951, you must also prepare and preserve a ceiling price list, showing the commodities in each category (listing each model, type, style, and kind) delivered or offered for delivery by you during the base period together with a description or identification of each such commodity and a statement of the ceiling price. Your ceiling price list may refer to an attached price list or catalogue. If you are a retailer you may satisfy the requirement of this paragraph (3) by recording on your purchase invoices, covering the commodities (including every model, type, style, and kind) delivered or offered for delivery by you during the base period, the price at which you sold, or offered the commodities for delivery, during the base period.

(4) You must also prepare and preserve a statement of your customary price differentials for terms and conditions of sale and classes of purchasers, which you had in effect during the base period.

Current records.

If you sell commodities or services covered by the regulation you must prepare and keep available for examination by the Director of Price Stabilization for a period of 2 years, records of the kind which you customarily keep showing the prices which you charge for the commodities or services: In addition, you must prepare and preserve records indicating clearly the basis upon which you have determined the ceiling price for any commodities or services not delivered by you or offered for delivery during the base period.

Oppose Aluminum Scrap Order

New York—Opposition to the aluminum scrap order (NPA M-22) has been expressed by the Metal Dealers Div. of the National Assn. of Waste Material Dealers, Inc. The group claims smaller smelters and fabricators cannot maintain normal operations, and diversion of scrap from normal channels prevents "sweating" operations that would help ease freight car shortages.

war work or Peace Work?

Ingenious system of Logan Trough Rolls, Level Rolls, Side Tilters, Upenders and Apron Conveyors handle brass coils to and from 4-Hi cold mills in world-famous new brass mill. There are large savings in time and effort.

Whichever you do, the problem is the same — *greater productivity.* This problem is being solved in many instances by conveyors to (a) keep equipment operating at capacity; (b) deliver material to operators at convenient working height; (c) save time and effort between processes. Logan Conveyors assure maximum returns in each instance, due to Logan planning and engineering. Experience counts. Two generations of it are behind every section of Logan equipment. Now is the time to conveyorize to the limit, so write for further information or for the nearest field engineer to call.

LOGAN CO. 75th ANNIVERSARY 1876 – 1951

Logan Conveyors

LOGAN CO., 545 CABEL ST., LOUISVILLE, KY.

fishin' is fun . . . with care on the run

Here's a fellow that enjoys complete relaxation. He knows his plant is safeguarded from fire . . . a short circuit, a stray spark, a forgotten cigarette or spontaneous combustion can't cut into production time, destroy valuable records or endanger the lives of employees.

You too, can have this same peace of mind about fire by fully protecting your investment in materials, equipment and buildings with modern, approved C-O-TWO Fire Protection Equipment.

No matter what your property . . . factory, mill, warehouse, power station or research center . . . or a particular fire hazard such as spray booth, dip tank, pump room, electrical equipment enclosure or record vault . . . there is a type of C-O-TWO Fire Protection Equipment that gives you fast, positive action the instant fire strikes. Whether it's a C-O-TWO Squeez-Grip Carbon Dioxide Type Fire Extinguisher for an incipient fire, or a C-O-TWO Built-In High Pressure or Low Pressure Carbon Dioxide Type Fire Extinguishing System for total flooding an entire fire hazardous area . . . C-O-TWO means experienced engineering that assures you of the best type equipment for the particular fire hazard concerned.

For example, at many locations a C-O-TWO Combination Smoke Detecting and Fire Extinguishing System is a "must". The first trace of smoke in a protected area sounds an alarm . . . then fast, clean, non-damaging, non-conducting carbon dioxide blankets the fire, putting it out in seconds, before it spreads and causes extensive damage.

So, let an expert C-O-TWO Fire Protection Engineer help you in planning complete and up-to-date fire protection facilities now. Write us today for complete free information . . . our experience is at your disposal.

C-O-TWO

C-O-TWO FIRE EQUIPMENT COMPANY

NEWARK 1 • NEW JERSEY

Sales and Service in the Principal Cities of United States and Canada

Affiliated with Pyrene Manufacturing Company

MANUFACTURERS OF APPROVED FIRE PROTECTION EQUIPMENT

Squeez-Grip Carbon Dioxide Type Fire Extinguishers • Dry Chemical Type Fire Extinguishers
Built-In High Pressure and Low Pressure Carbon Dioxide Type Fire Extinguishing Systems
Built-In Smoke and Heat Fire Detecting Systems

NPA Battery of Tin Orders, Amendment Cuts Down Tin Use

Washington—National Production Authority issued four new orders (M-24, M-25, M-26, M-27) and amended M-8, banning the use of tin except for specified purposes, prohibiting its use in certain end products, and restricting the amounts which may be used in others.

The limitation of pig tin use to 80 pct (of the base period) during February and March is not affected. But a similar restriction with respect to secondary tin has been lifted.

Former Limitation Unaffected

Effective immediately, certification is required for all non-defense uses of tin and terneplate Also, maximums are specified for coatings for the various permitted purposes. Even reconditioned tin and terneplate are limited to specified purposes.

Restrictions are placed on two other uses. Manufactures of bottle caps and other closures are not limited as to quantity but coatings are cut back in tin content. The use of tin for collapsible tubes is restricted in varying amounts according to intended tube use.

Warehouse Head Favors CMP

Washington — The steel warehouse industry "cannot hope to begin to take care of even a small part of the needs" of small business after steel production has been bled white by stockpiling, military needs, and special programs, said Mrs. Ethel B. Purdy, president of A. R. Purdy Co., Inc., warehouse at Lyndhurst, N. J.

Speaking before the Senate Committee on Small Business recently, she said that a controlled materials plan "at the earliest possible date" was n e e d e d. Warehouse stocks are dipping to the same critical state as in early World War II when the shortage cut back production, she stated. Mrs. Purdy continued that Reg. M-6, the steel warehouse order, had no teeth and was a mere guide for producers.

Rated Steel Order Limits Rise Under NPA M-1 Amendment

Provides specific inventory controls for producer and consumer.

Washington — Most percentage ceilings for acceptance of rated steel orders have been increased, specific inventory controls for producer and consumer have been provided, more ferrous products added, and some lead times changed under an amendment to NPA order M-1, effective immediately.

The order also designates producers who sell for further conversion as "producer suppliers" and those in conversion or fabrication as "converters." Previous allocation provisions now apply to them.

Make Monthly Allotment

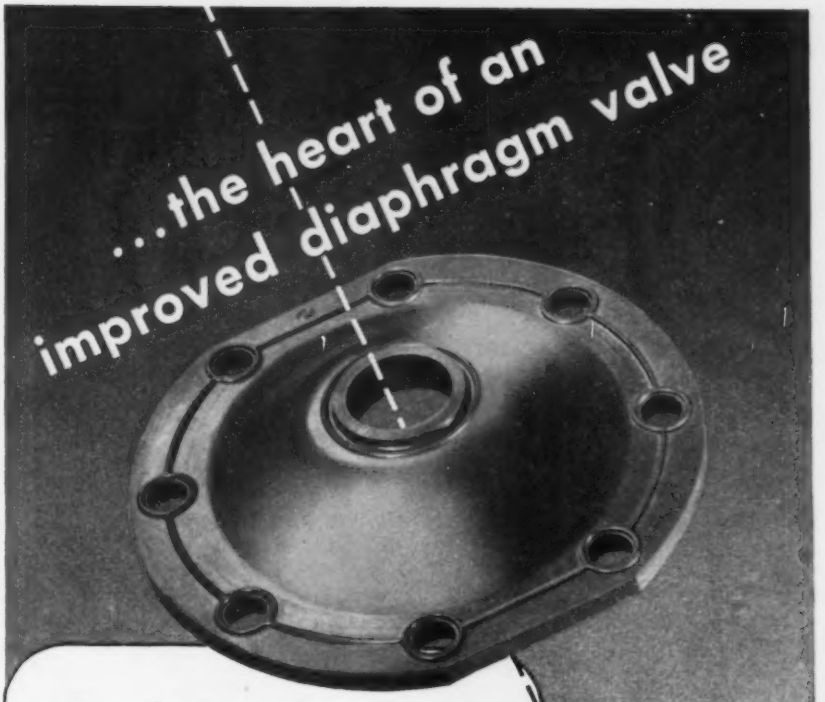
A producer supplier must make a monthly allotment of his steel products remaining after filling rated and special program orders to each of his converter customers. It must equal the percentage of "his available production so remaining as the producer supplier's shipments to each converter customer bore to his total shipment during the base period from Jan. 1, 1950, through Sept. 30, 1950."

A producer supplier must accept orders from his converter customer up to the limit of his allotment—providing they agree with lead time provided by order. Products added to the original order include: steel castings and forgings, wire rope and strand, pig iron, and malleable gray iron castings.

The order was changed to provide minimum quantities below which producers are not obliged to accept order. They range from 500 lb to carloads, according to product, while in other cases the buyer and producer agree on quantity.

A 45-day inventory is set for steel products and malleable and gray iron castings, while the maximum for pig iron is set at 30 days or a minimum working level, whichever is less.

Some original lead times have



This rubber diaphragm is a vital part of an improved "packless" valve recently developed. It provides an air tight seal for hard-to-hold gases or volatile, corrosive fluids. The diaphragm is strong enough to contain high pressures—yet sufficiently flexible to permit easy valve action.

In addition to heat, chemical, and abrasion resistance, the rubber diaphragms must endure test flexings equal to many years of normal operation.

Continental met—and exceeded—these exacting manufacturing specifications. The solution of this problem typifies the technical service in rubber offered by Continental.

When *you* need better engineered rubber parts, why not enlist the help of specialists?

LET US SEND YOU THIS CATALOG

This new engineering catalog lists hundreds of standard grommets, bushings, rings and extruded shapes. It will be a valuable addition to your working file. Send for your copy today or..

See our Catalog in Sweet's File for Product Designers

MANUFACTURERS SINCE 1903

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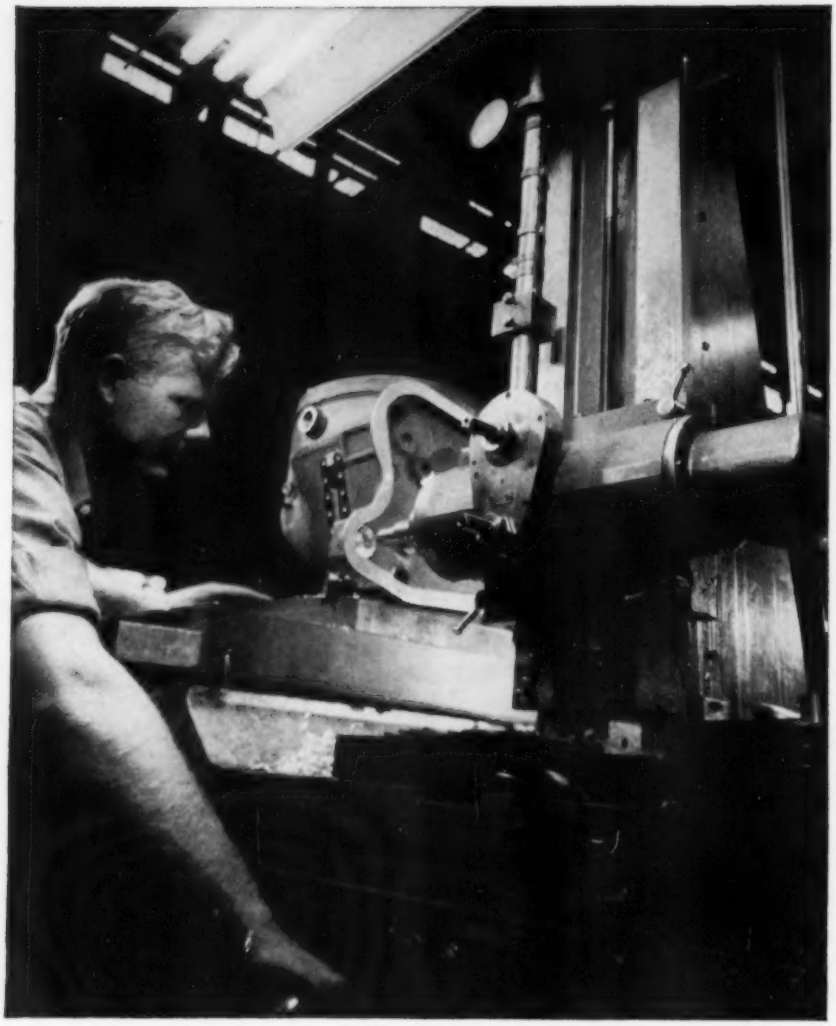
BRANCHES

Baltimore, Md.	Cleveland, Ohio	Kansas City, Mo.	Pittsburgh, Pa.
Boston, Mass.	Dayton, Ohio	Los Angeles, Calif.	Rochester, N. Y.
Buffalo, N. Y.	Detroit, Mich.	Memphis, Tenn.	St. Louis, Mo.
Chicago, Ill.	Hartford, Conn.	New York, N. Y.	San Francisco, Calif.
Cincinnati, Ohio	Indianapolis, Ind.	Philadelphia, Pa.	Syracuse, N. Y.



This picture* does not equal 10,000 words

This is a fine photograph—but men and machines are only part of the story at IGW. It takes esprit de corps (a much overworked term that fits here)—it takes pride of workmanship to produce fine precision gears and parts.

* **This Horizontal Jig Borer is typical of the high precision tools designed and built by Indiana Gear for their own use.**

Indiana GEARS

GEARS • CAMS • INTRICATE AND PRECISE MACHINE PARTS

INDIANA GEAR WORKS • INDIANAPOLIS 7, IND.

been changed, such as rolled armor plate and others requiring a longer production period because of manufacturing and special treating processes.

DO acceptance percentages for carbon steel products are now:

20 pct — structural shapes, rough castings (including high and low alloy and carbon), rough forgings, and both malleable and gray iron castings.

15 pct—piling, plates, reinforcing and cold-finished bars.

12 pct — hot and cold-rolled sheets.

10 pct—rails, wire rods, hot-rolled bars, mechanical and pressure tubing, hot and cold-rolled strip, and joint bars, tie plates, and track spikes.

7 pct — galvanized and other coated sheets, and electric sheets and strip.

5 pct — ingots, blooms, slabs, billets, skelp, line and standard pipe, barbed wire, bale ties, woven fence, drawn wire, nails and staples, tin mill blackplate, hot-dipped tin and terneplate, and electrolytic tinplate, and enameling.

Stainless Steel Ceiling

A ceiling of 25 pct is established for the following stainless steel items: ingots, blooms, slabs, billets, plate, hot-rolled bars, cold-finished bars, standard pipe, pressure and mechanical tubing, drawn wire, hot and cold-rolled sheets and strip. Stainless malleable and gray iron castings must be accepted up to 20 pct.

Acceptance ceilings for full alloy products are: 35 pct, blooms, billets, slabs, hot-rolled bars, mechanical tubing; 25 pct, ingots, wire ropes, cold-finished bars, pressure tubing, drawn wire; 15 pct, plates; 7 pct, electric sheet; and 5 pct, hot and cold-rolled strip and sheet.

Buffalo Firm 125 Years Old

Buffalo — Beals, McCarthy & Rogers, Inc., handlers of steel and industrial supplies, will observe their 125th anniversary with an open house and celebration Feb 6 to 8.

STEEL CONSTRUCTION NEWS

New York—Total bookings of fabricated structural steel for 1950 are estimated at 2,529,832 tons and were the highest on record since 1930, according to reports received by the American Institute of Steel Construction, Inc. December bookings of 224,808 tons were 81% greater than for the corresponding month in the previous year, while the annual bookings exceeded 1949 by 77%.

1950 shipments amounted to 1,931,527 tons, an increase of 4% over the 1,853,536 tons shipped in 1949. The shipments for December were 175,575 tons, 30% over December of last year.

The backlog (tonnage available for future fabrication) for the next four months only stands at 736,340 tons, and for the period beyond these four months amounts to 1,177,695 tons, or a total potential for work ahead of 1,914,035 tons.

Following is the complete tabulation of bookings and shipments:

Estimated Total Tonnage for the Entire Industry

Contracts Closed	1950	1949	Avg. 1936/1940
January	119,317	130,418	107,578
February	117,664	108,764	96,280
March	189,420	149,079	124,558
April	155,011	98,802	110,783
May	192,319	116,975	126,237
June	266,612	96,952	125,835
July	272,745	126,255	152,481
August	259,212	98,953	113,135
September	251,054	120,373	137,982
October	236,170*	158,593	141,557
November	245,500*	103,557	129,757
December	224,808	124,251	143,313
Totals	2,529,832	1,432,972	1,509,496
Shipments			
January	135,253	152,746	92,578
February	129,628	145,879	88,626
March	156,781	185,885	115,031
April	164,440	179,206	123,650
May	168,113	171,101	123,225
June	172,096	172,260	129,969
July	141,576	147,960	127,422
August	180,688	183,868	136,389
September	157,000	162,139	137,255
October	183,318*	99,812	140,944
November	167,059*	117,180	127,873
December	175,575	135,500	121.664
Totals	1,931,527	1,853,536	1,464,626

*Revised

Tonnage Available for Fabrication

Within the next four months (To April 30, 1951): 736,340 — 555,360 — 363,288

After the next four months (From May 1, 1951): 1,177,695 — 421,404 — 117,398

January 25, 1951

Fabricated steel awards this week included the following:

1250 Tons, Newark, N. J., highway bridge, Route 25A, Sect. 1G, El Dorer Construction Co., low bidder.

1080 Tons, Montgomery County, Pa., highway bridge, Pennsylvania Dept. of Highways, to American Bridge Co., Pittsburgh.

311 Tons, New Orleans, La., South Carrollton Avenue underpass for City of New Orleans, R. P. Farnsworth, contractor, to Virginia Bridge Company, Birmingham, Ala.

110 Tons, Seaford, Del., addition to plant of E. I. duPont de Nemours Co., to Bethlehem Fabricators, Inc., Bethlehem.

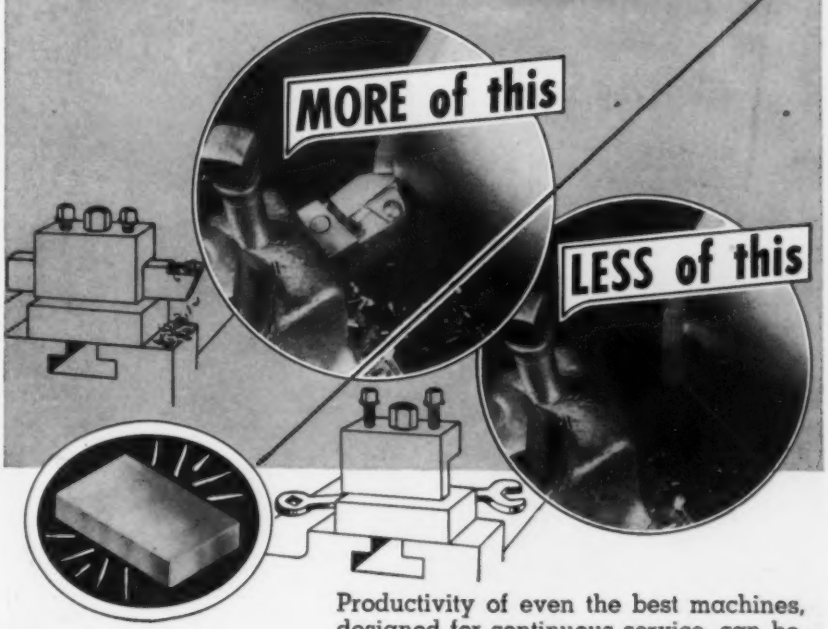
Fabricated steel inquiries this week included the following:

570 Tons, Newcastle, Del., highway bridge for Delaware Dept. of Highways, bids due Feb. 7.

500 Tons, Weston, N. J., bridge for the Reading Co., bids due Feb. 2.

350 Tons, State College, Pa., Burrowes Building, Pennsylvania State College, bids due Feb. 7.

HOW TO REDUCE "LOST-BUT-PAID-FOR" MACHINE HOURS



Productivity of even the best machines, designed for continuous service, can be, and often is, woefully curtailed by inferior tools that wear rapidly and require frequent shutdown for replacement. Production is thereby recurrently interrupted, *but* costs never cease. Lost time must be paid for.

Kennametal tools, on the contrary, have a remarkably long service life. Outstanding durability is inherent. They work more hours per day, spend less time in the grinding room, and thus help reduce idle machine time, make operators more efficient, reduce tool inventory. Superior performance is attained because the physical structure of Kennametal is sound and uniform — the desired properties of hardness, strength, and toughness are consistent.

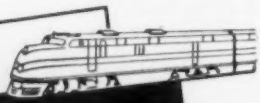
These outstanding characteristics are achieved through a unique coordination of manufacture and all-inclusive control from raw materials to finished product — refinement of all carbides directly from ores, oxides, and by-products — processing of these carbides into Kennametal compositions by exclusive methods and patented techniques — fabrication of complete tools and wear-part designs that fully utilize the distinctive properties of Kennametal.

For those who wish assistance in developing the most efficient tool applications Kennametal Inc. maintains a corps of competent Field Engineers in all important industrial centers. Their services are available for helping you to reduce lost-but-paid-for machine hours.

KENNAMETAL *Inc.*, Latrobe, Pa.

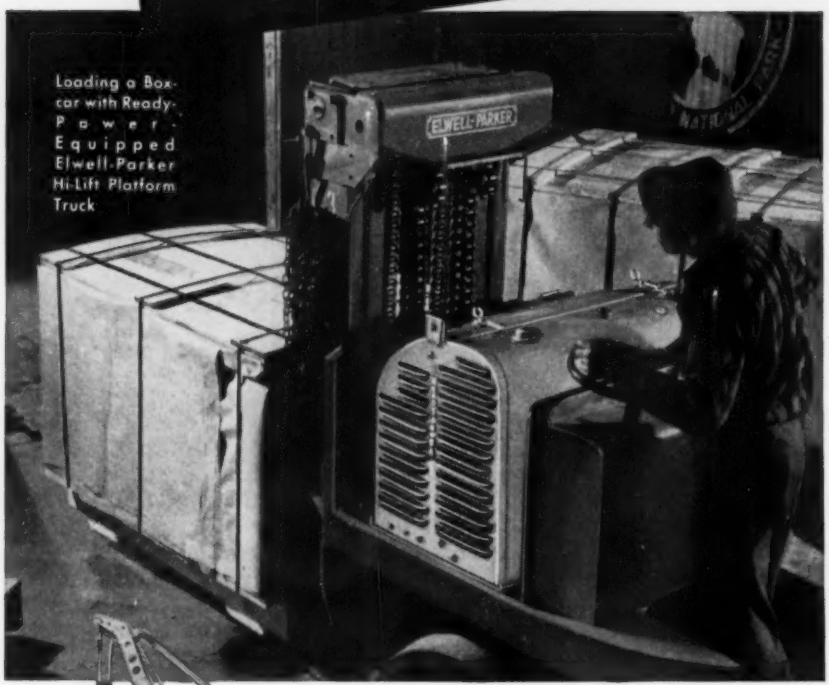
MANUFACTURERS OF SUPERIOR CEMENTED CARBIDES AND CUTTING TOOLS THAT INCREASE PRODUCTIVITY

for CONTINUOUS ELECTRIC POWER



Diesel-Electric Locomotives

READY-POWER-equipped ELECTRIC-TRUCKS



Loading a Box-car with Ready-Power Equipped Elwell-Parker Hi-Lift Platform Truck

Yale Crane Truck Equipped with Ready Power

Ready-Power-Equipped Automatic Fork Truck

Modern Diesel-electric locomotives and Ready-Power-equipped electric trucks operate alike. Both generate dependable electric power right on the vehicle; both operate economically; and both excel where long, continuous operation pays off. Your electric trucks will do more work at less cost when equipped with Ready-Power. There are models for every type, size and make of electric truck.

THE READY-POWER CO.

3822 Grand River Ave., Detroit 8, Michigan

• *News of Industry* •

McKee Gets Armco Contract

Middletown, Ohio — Contracts have been negotiated for the $35,000,000 blast furnace and coke ovens soon to be built here by Armco Steel Corp., said J. S. Thomas, director of Armco purchases.

The Arthur G. McKee Co., Cleveland, will build the blast furnace. The Wilputte Coke Oven Division, of Allied Chemical & Dye Corp., got the contract for 76 coke ovens and by-products plant.

F. H. McGraw Construction Co., Middletown, received contracts to construct railroad tracks, roads, sewers and other items. Construction will start as soon as deliveries of steelwork and equipment can be made.

Biggest Turbojet Passes Test

Pittsburgh—The most powerful turbojet engine in the world, developing thrust equal to 14,000 hp, has successfully completed ground tests according to Westinghouse Electric Corp. which is making the Navy J-40 engine.

The J-40, operated with a single throttle-like control, uses a unique annular combustion chamber. Due to heat expansion the engine grows a full inch in length while in operation.

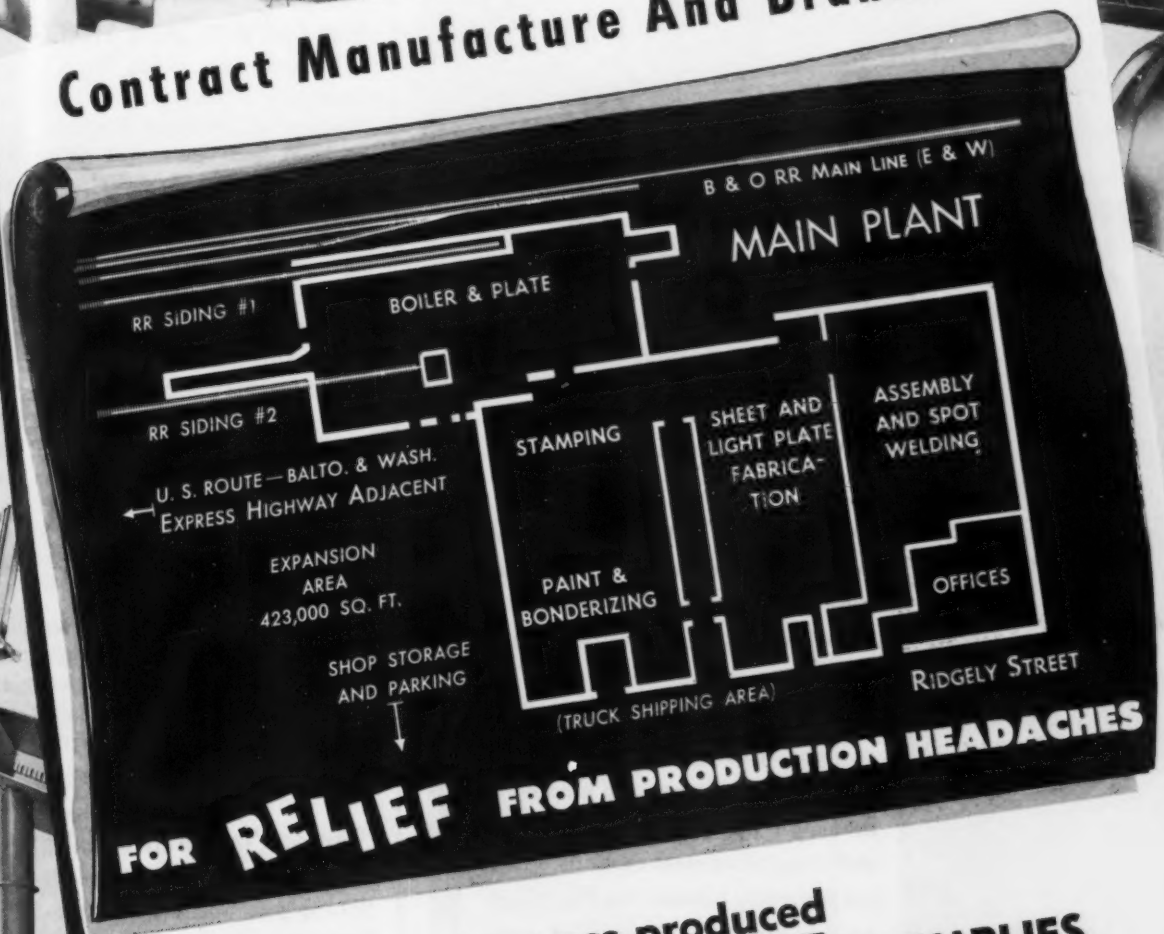
Foote to Make Zirconium for AEC

Philadelphia—U. S. Atomic Energy Commission contracts to produce ductile zirconium for experimental purposes have been awarded to the Foote Mineral Co., here. Foote has been making the metal commercially since 1942. Properties of good corrosion resistance, strength and weight, and a low tendency to capture neutrons adapt the metal for use in atomic furnaces.

Morrow to Receive Coal Medal

Birmingham—James Bain Morrow, vice,president of the Pittsburgh Consolidated Coal Co., will receive the 1951 Erskine Ramsay Award for "distinguished service in the coal industry" at Feb. 21 rites in St. Louis.

Contract Manufacture And Brandt—



FOR RELIEF FROM PRODUCTION HEADACHES

in mass produced STAMPINGS, SPOT WELDED ASSEMBLIES, WELDMENTS and PRESSED STEEL SHAPES from all types of metal

• Brandt at your service means several hundred thousand square feet of facilities coordinated for your special production needs. Brandt—near steel mills, in the midst of major rail, water and highway transportation systems—offers assembly line scheduling, precision workmanship to exacting specifications and on-the-dot deliveries.

BRANDT
BALTIMORE

CHARLES T. BRANDT, INC.
1700 Ridgely Street, Baltimore 30, Md.

9500 Cuts On ¼" Alloy Valve Stock With

Electro's NEW CUTRITE CUT-OFF WHEELS

No time now for delays, waste or faulty production even in preparatory work!

Here's Electro with a *new* cut-off wheel of *proved* superiority in performance and durability. Think what these performance records mean to you . . .

2" x 1¾" risers cut on nickel-iron castings in 16 seconds! 9500 cuts on ¼" alloy valve stock. No binding or breakage on 5½" x 2½" heavy, stainless, alloy steel castings which are normally burned. 46.6% longer service than the average of competitive wheels on 1" stainless, low carbon, beryllium copper, silicon bronze and manganese bronze stock; and outlived and outperformed competitive wheels on 15/32" carbon steel, drill bit rod.

ELECTRO REFRACTORIES AND ALLOYS CORPORATION
344 Delaware Ave., Buffalo 2, N. Y.
West Coast Warehouse . . . Los Angeles
Canadian Electric Furnace Plant, P. Q.

Write, wire or *phone*. We'll get a Field Engineer to you quick to prove these new wheels on *your* job. The same research skill and engineering competence that produced these new wheels are at your command upon request for cooperation on rough operations like snagging, or precision work like roll grinding.

Electro HIGH-SPEED GRINDING WHEELS
STRONG • SAFE • EFFICIENT

British Carmakers' Output May Fall with Sheet Steel Cut

London—Badgered by a grave nonferrous metals shortage, car makers in England thought they at least had one cloud with a silver lining. Steel mills were setting output records and the auto industry reasoned that they would be cut only 5 pct. With this steel present production could be maintained.

But this month car makers were told to expect a cut in sheet steel that may reduce output by 15 to 20 pct. Many companies will be forced on a 4-day week. Some relief in the sheet supply picture may come with the opening of new mills at Margam, South Wales, this summer.

Blame for the cut is put on slumping sheet imports and the defense program. Output was estimated at 140,000 passenger cars and 65,000 commercial vehicles in the last quarter of 1950.

Signode Plans Weirton Growth

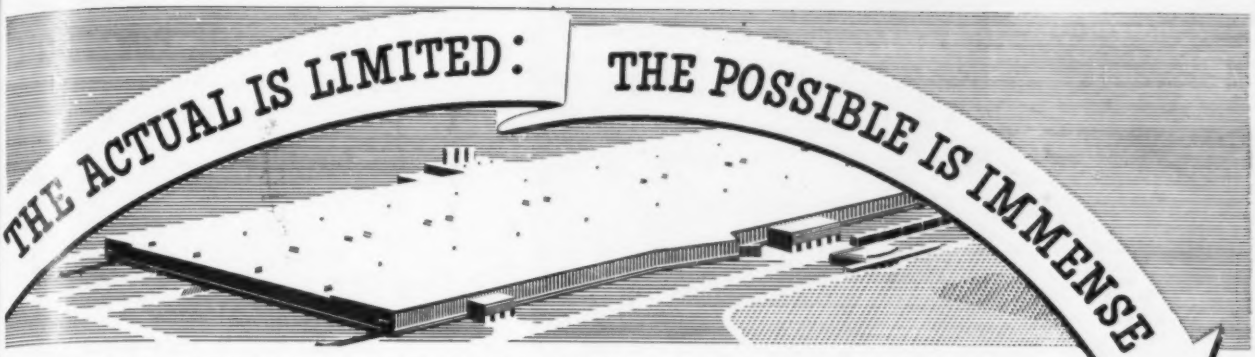
Pittsburgh — Signode Steel Strapping Co. will expand its Weirton, W. Va., operations with construction of a new plant 420 ft long and 150 ft wide. Employment, now totaling 25, will increase to 250. The original plant, a quonset-type building, will be used as a storehouse.

Won't Build Giant Airliners

London—Britain will postpone building any more Bristol Brabazon airliners beyond the first two it now has. The project will remain a research experiment. Work on the giant airliner project opened in 1945 and $32 million was spent so far.

Blaw-Knox to Build Gun Mounts

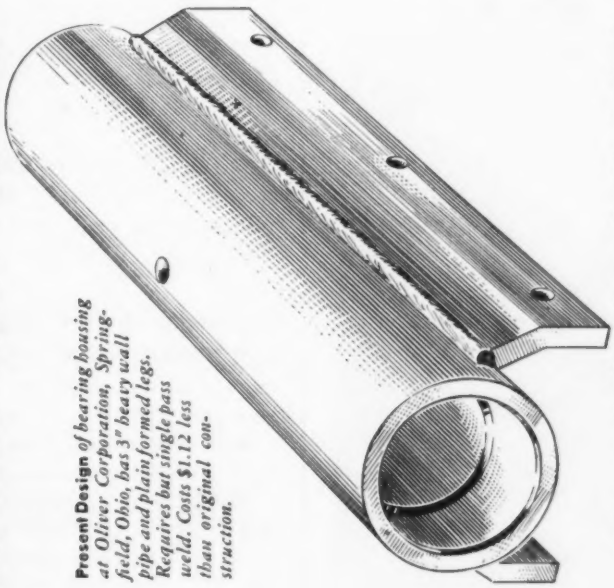
Pittsburgh—Lewis Foundry & Machine Div. of Blaw-Knox Co. will produce anti-aircraft gun mounts for the U. S. Navy. During World War II, the company produced Bofors naval anti-aircraft gun mounts.



NEW LINCOLN PLANT CREATED BY INCENTIVE INSPIRED CO-ACTION IN DEVELOPING POSSIBILITIES IN PRODUCT

© LE Co. 1951

MANUFACTURER CUTS TOOLING COST $800.00



Present Design *of bearing housing at Oliver Corporation, Springfield, Ohio, has 3" heavy wall pipe and plain formed legs. Requires but single pass weld. Costs $1.12 less than original construction.*

BY simple redesign to welded steel, substantial savings are being effected in the production of these bearing housings. At the same time, product strength and rigidity have been increased to assure maximum serviceability . . . long-lived operation. An initial saving of $800.00 on setup and tooling expense results from the elimination of drill jigs and boring fixtures as well as for patterns and core boxes required with the original construction.

Component parts are now preformed prior to welded assembly in a plain, low-cost, clamp type fixture. The tubing itself is bored as a simple lathe operation and the legs prepunched and bent as shown.

The resulting simplified production now possible with the welded steel construction is increasing the rate of output . . . reducing unit cost $1.12 per piece.

How To DESIGN FOR WELDED STEEL is presented in the new 9th Edition "Procedure Handbook of Arc Welding Design and Practice." Contains latest data on machine design together with cost figures. Price only $2.00 postpaid in U.S.A.; $2.50 elsewhere.

the ACTUAL

Original Cast Construction *of bearing housing required fixtures for extensive boring and drilling operations.*

increasing the YIELD

First Changeover *to welded steel design has 90° formed legs welded to thin wall tubing. Was welded top and bottom as shown.*

the IMMENSITY of the POSSIBLE

A saving in cost of 24%

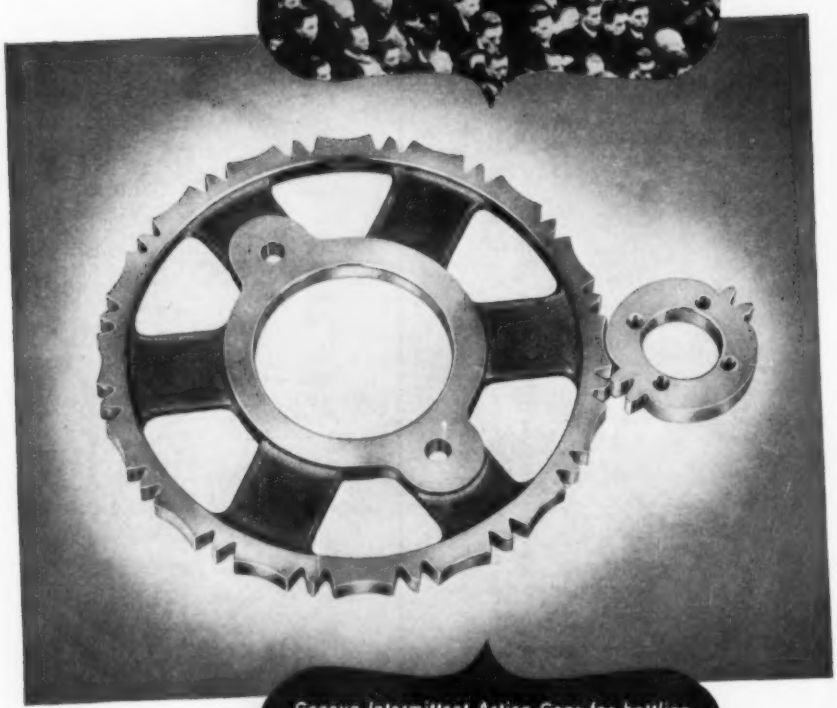
SEE HOW WELDED STEEL DESIGN SIMPLIFIES PRODUCTION

Machine Design Sheets free on request to designers and engineers. Write on your letterhead to Dept. 52,

THE LINCOLN ELECTRIC COMPANY

CLEVELAND 1, OHIO

Perkins' Customers provide the BEST ADVERTISING for PERKINS *custom-made* GEARS



Geneva Intermittent Action Gear for bottling machine CUSTOM-MADE by Perkins

Perkins Gears are most widely used by manufacturers who are known everywhere for the high quality of their own products. And many of them first came to us with their gear supply problems through the recommendations of one or more of our long-term and eminently satisfied customers.

Perkins Gears are built to serve *economically and dependably* on the job for which you buy them — and to do credit to your product and your reputation.

Send samples or prints and specifications for immediate quotations. Send for your free copy of our bulletin "Perkins Gears" for data on our gear engineering facilities.

PERKINS MAKES TO CUSTOMERS' SPECIFICATIONS:
Helical Gears • Bevel Gears • Ratchets • Worm Gears • Spiral Gears • Spur Gears with shaved or ground teeth • Ground Thread Worms
IN ALL MATERIALS, METALLIC & NON-METALLIC

PERKINS MACHINE & GEAR CO.
WEST SPRINGFIELD, Massachusetts

Want the Facts—Hard and Cold

Pittsburgh—To the question of whether they wanted an elaborate or a plain annual report, stockholders of Allegheny Ludlum Steel Corp. voted 2-to-1 in favor of the unadorned report.

A survey by the company of its 13,304 stockholders brought replies from 3266 as of last week, or 24.5 pct. A breakdown showed that 966 or 29.6 pct of those answering preferred the fancy report; 1787 or 54.7 pct the plain, factual report; and 436 or 13.3 pct simply financial statistics and auditors' letter. A combination of the latter two totaled 2223, or 68 pct.

The results were contrary to the popular belief that stockholders like multi-color reports with plenty of charts and pictures.

Westinghouse Plans Expansion

Pittsburgh—Westinghouse Electric Corp. announced an expansion program that will increase generator production capacity at its East Pittsburgh plant by 65 pct.

The program calls for construction of two buildings to provide more than 300,000 additional sq ft for large generator production, making possible the building of larger than 150,000 kw high-speed 3600 rpm generators.

Three old buildings will be razed to make room for the new structures.

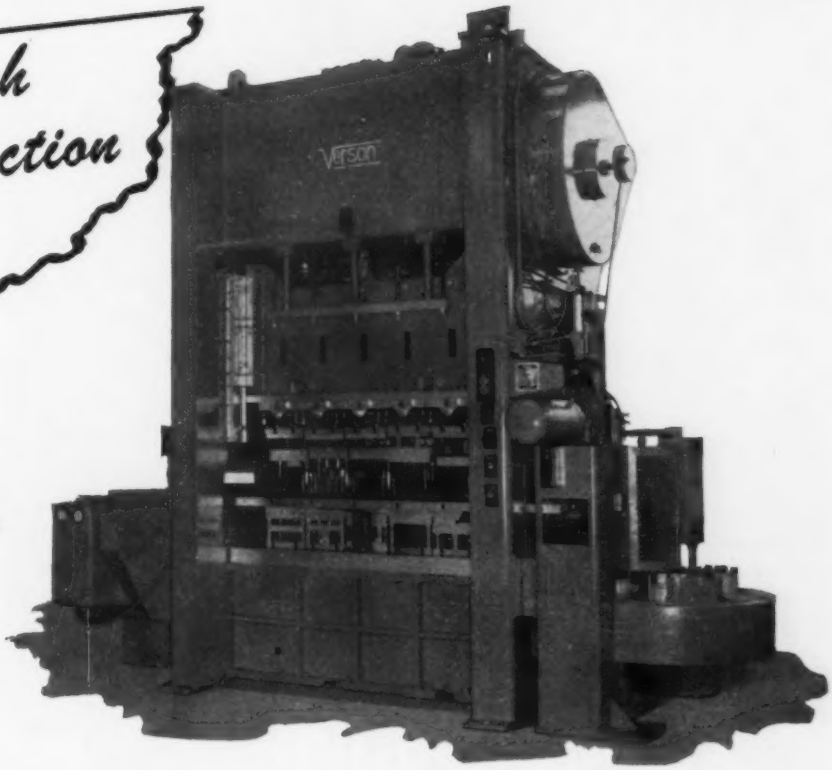
Steel Forgings Down in Nov.

Washington — November shipments of commercial steel forgings totaled 130,000 tons, compared with 137,000 tons in October and 73,000 tons in November of 1949. Unfilled orders at the end of November totaled 657,000 tons.

Armco's Sebald Starts Trust Fund

Middletown, Ohio — A trust fund of $50,000 to aid sick and needy children in the community has been established by W. W. Sebald, president of Armco Steel Corp., in "appreciation for good neighborliness of the people of Middletown."

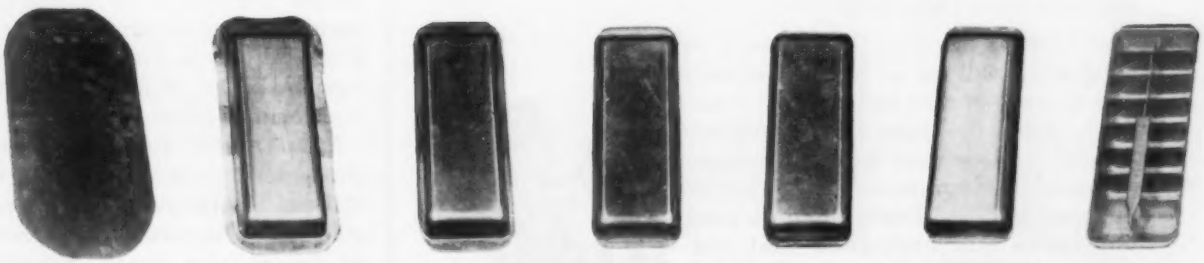
Can you match these production figures?



THIS TRADE Verson MARK TRANSMAT PRESS automatically produces over 1800 ice cube trays per hour!

If you mass produce press formed metal products, Verson TRANSMAT Presses and tooling offer a time-saving, cost-cutting and space-saving method of high speed, automatic metal forming. Utilizing coil stock or blanks (depending on scrap economy), TRANSMAT Presses automatically perform successive operations without intermediate handling, pickling or annealing. One press does the work of several in a fraction of the space at a fraction of the cost.

TRANSMAT forming is now adaptable to a wide variety of shapes that range from deep drawn automotive coil containers to intricate washing machine legs. We will be pleased to show you what TRANSMAT Presses have done for others and what they can do for you. Write for details.



An ice cube tray every two seconds . . . from blank to finished stamping in five automatic operations without intermediate handling. At right is the finished tray assembly. A single TRANSMAT Press with one operator increased production 350% and released three presses and five operators for other work.

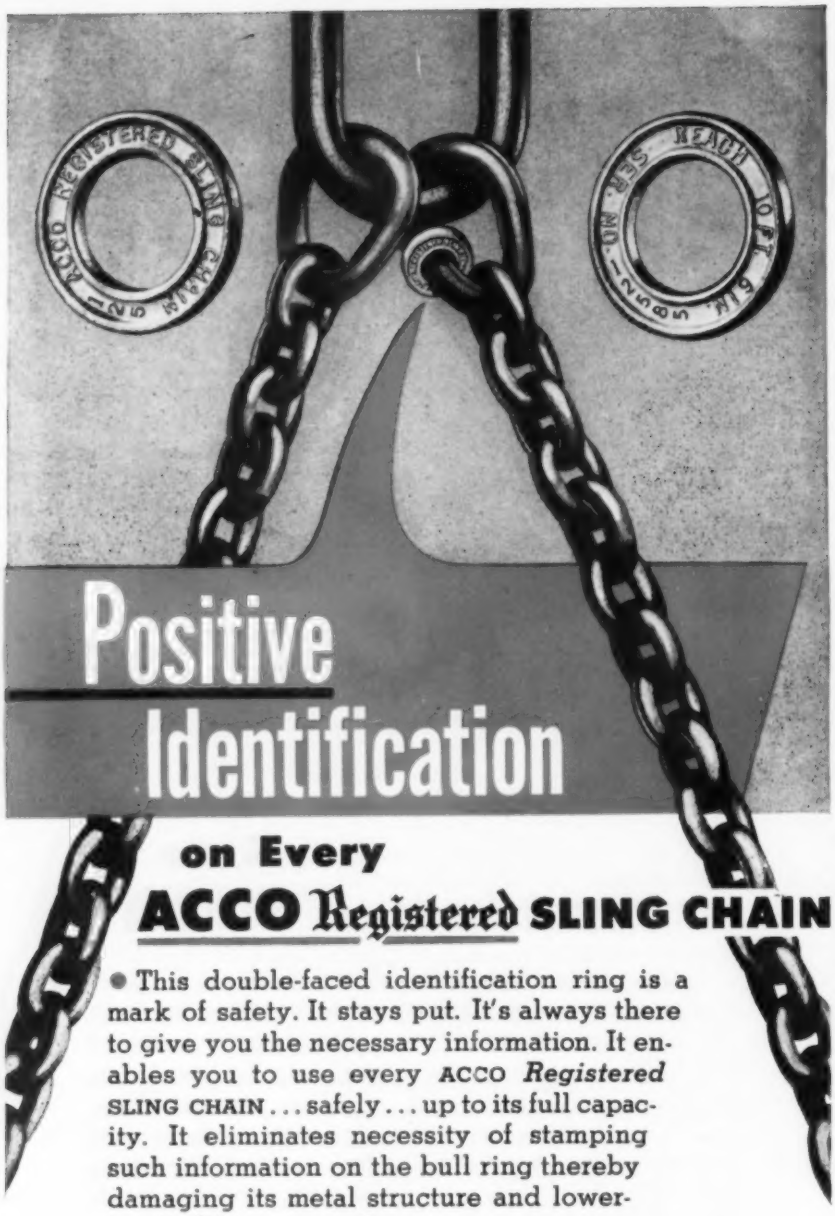
Originators and Pioneers of Allsteel Stamping Press Construction

VERSON ALLSTEEL PRESS COMPANY

9314 South Kenwood Avenue, Chicago 19, Illinois — Holmes Street and Ledbetter Drive, Dallas 8, Texas

A VERSON PRESS FOR EVERY JOB FROM 60 TONS UP!

MECHANICAL AND HYDRAULIC PRESSES AND PRESS BRAKES • TRANSMAT PRESSES • TOOLING
DIE CUSHIONS • COMPRESSION AND TRANSFER MOLDING PRESSES



Positive Identification

on Every ACCO Registered SLING CHAIN

● This double-faced identification ring is a mark of safety. It stays put. It's always there to give you the necessary information. It enables you to use every ACCO *Registered* SLING CHAIN . . . safely . . . up to its full capacity. It eliminates necessity of stamping such information on the bull ring thereby damaging its metal structure and lowering its lifting capacity.

Don't Gamble . . Don't guess that a certain sling chain will lift an expensive machine. The damage to men and material is far too costly. Select the types, sizes and materials needed for your work from the complete line of ACCO *Registered* SLING CHAINS. The positive identification ring on each one gives you assurance that the unit was rigidly inspected and fully tested. You can't buy better sling chains.

Send for your copy of **Catalog DH-80.** *It shows you how to select, use, and care for sling chains.*

"Intentionally Better" **SLING CHAINS**

ACCO York, Pa., Atlanta, Chicago, Denver, Detroit, Los Angeles, New York, Philadelphia, Pittsburgh, Portland, San Francisco, Bridgeport, Conn.

TRADE MARK

AMERICAN CHAIN DIVISION
AMERICAN CHAIN & CABLE

In Business for Your Safety

Raw Material Shortages May Lower British Steelmaking in '51

London—British steel output in 1950 reached a new high of 18,247,824 tons—or 328,000 tons over the Government mark and 828,000 tons above production in 1949. But now that the industry is on the doorstep to initiative-deadening nationalization, steel men will not make any optimistic predictions. This despite the 500,000 tons of new capacity to come in this year.

Raw material shortages are likely to cut steel production in the early months of 1950. Coke deliveries are currently below consumption and stockpiles are low. A major coal producer, England was forced to divert shipping from iron ore to import coal. Stocks of imported ore, at a good level last year, have been severely cut.

Imports of German scrap have been dwindling and are expected to dip to 1,125,000 tons in '51 as compared with 2,250,000 tons last year. A scrap drive has started in England but steelmakers doubt whether this will offset the deficit.

In addition to nationalization woes, melting shop workers will ask a 40-hr week at negotiations this month.

ACF Smooths Way for P.A.'s

New York—An attempt to lighten the load of its purchasing agents, and of salesmen calling at American Car & Foundry Co., has been made by ACF with its new "welcome" booklet.

The booklet lists purchasing personnel for the various ACF divisions. Engineers, inspectors and others who have contact with suppliers are also listed. Salesmen are advised what the company makes and the best hours to call.

Construction Boomed in '50

New York—Construction in 37 eastern states during 1950 showed a 40 pct increase over 1949 figures, for a total of some $14½ billion, according to the F. W. Dodge Corp. Residential construction was up 59 pct for a total of $6,741,028,000.

the magnet that answers THE NEED

Dings New Improved Lifting Magnet . . . Weighs Less, Lifts More, and Lasts Longer

THIS latest Dings magnet has *all* the features necessary for maximum scrap yard performance. A few examples . . .

WELDED STEEL CONSTRUCTION—eliminates the moisture danger, makes a strong rigid magnet that can take the hard blows.

LIGHTER WEIGHT—*More* of the weight your crane is carrying will be payload. A balanced magnetic circuit of advanced design makes this difference.

MAXIMUM POWER, LONGER—No. 1 reason for this is less heat rise due to the improved magnetic circuit. In addition, a new, finer insulating compound dissipates strength-sapping heat, prevents electrical leakage between coil wires.

Those are the *big* new features. There are a dozen other important ones you'll be interested in.

FOR FULL DETAILS, WRITE for the LIFTING MAGNET CATALOG.

DINGS MAGNETIC SEPARATOR CO.
4709 W. Electric Ave., Milwaukee 46, Wis.

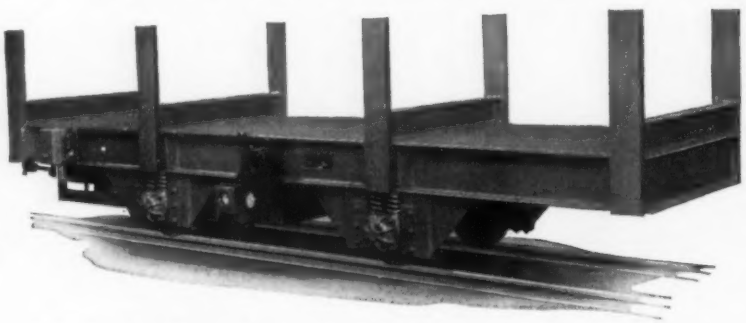
Dings Certified MAGNETIC STRENGTH

ATLAS

INTERPLANT HAULAGE EQUIPMENT

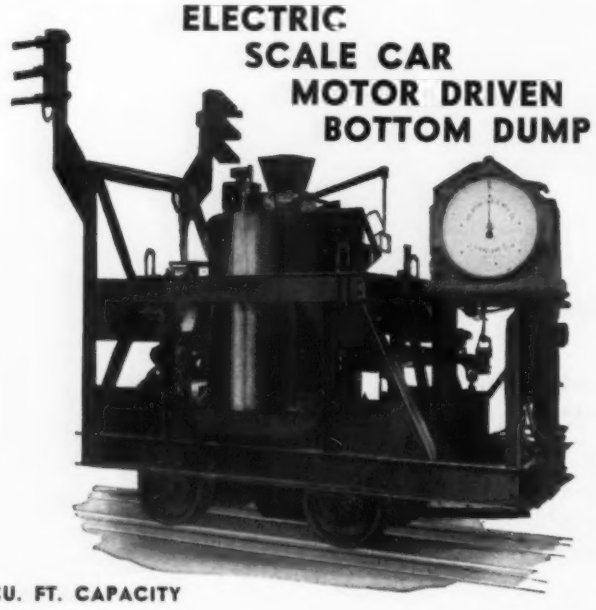
SPEEDS PRODUCTION

10 TON STORAGE BATTERY FLAT CAR



Built for handling pipe and conduit. Powered by storage battery. Geared to travel at walking speed when controller is held in operating position. Automatic "shut-off" and brake applied when spring return handle of the controller is released.

ELECTRIC SCALE CAR MOTOR DRIVEN BOTTOM DUMP



36 CU. FT. CAPACITY

For use in chemical plants. Cylindrical type body with dust filter. Mounted on Atlas Scale with 24" Atlas Dial and type-printing recorder. Car equipped with brakes, levers for operating discharge and loading chutes.

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Texas Gas Adding 580 Miles To Pipe System: Cost $42 Million

New York—Plans for 580 miles of large diameter gas pipeline which will raise daily deliveries on the Texas-Ohio system by 200 million cubic feet have been announced by the Texas Gas Transmission Corp. The new links and compressor stations will cost $42.3 millions.

Main items will be a 372 mile, 26 in. loop line from Bastrop, La., to Hardinsburg, Ky.; a 195 mile linkup of gas gathering subsidiaries in the Gulf Coast region of southwestern Louisiana with the company's main line in the northern part of the state; a 13,470-hp compressor including a new 4400-hp station near Madison, Ind.

Bethlehem Salesman Retires

Chicago — The retirement of Hubert A. Cillis, salesman in the Chicago district sales office of Bethlehem Steel Co., has been announced by J. F. Hennessy, district manager of sales. Mr. Cillis entered the employ of the sales division of Midvale Steel & Ordnance Co. in 1917. When Bethlehem Steel Co. acquired the Johnstown, Pa., plant of Midvale in 1923, Mr. Cillis continued with Bethlehem in the Chicago office sales department.

Harter Receives Newcomen Award

Philadelphia — The Newcomen medal for steam research has been awarded to Isaac Harter, chairman of the board of Babcock & Wilcox Tube Co.

The award was made at a joint meeting of the Newcomen Society and The Franklin Institute. Mr. Harter has been instrumental in developing welded boilers and in research on boiler corrosion.

Named Head of Coke Division

Washington—George P. Wilson, Jr., manager of the Control Section, Engineering and Construction Div., Koppers Co., Inc., was named director of the coke division of Defense Solid Fuels.

New Hot Strip Mill to Alter France's Role as Sheet Importer

Paris—France will drop her role as an importer of steel sheets now that USINOR's 66-in. continuous hot strip mill at Denain, North France, was put into operation late last month. First of its type in Europe, with an approximate output of 700,000 tons annually, the mill will in few months be able to fully supply the Montatair cold reduction mill. Montatair has been importing coils from America.

The Denain mill has a slabbing mill able to roll 15 ton ingots straight from steelmaking furnaces; four roughing stands and six finishing stands; a coiler with flying shears. With capacity set at 800,000 tons annually and production expected to reach 700,000 tons, Denain will ship about 360,000 tons per year to Montatair—which will cold-roll sheets primarily for the car industry in Paris.

To meet the steel needs of Denain, Usinor has enlarged two blast furnaces at Trith-Saint-Leger and is building a blast furnace and openhearth at Denain. SOLLAC's hot strip mill in Lorraine, with an 830,000 ton capacity, will be in production sometime in 1952.

BCR to Meet in Columbus Feb. 7

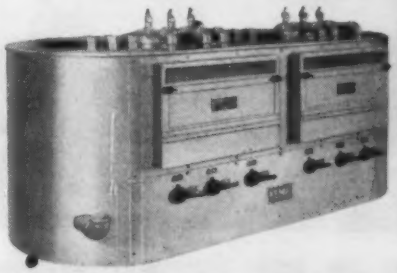
Columbus, Ohio—"Research to Meet Competition" will be the theme of the annual meeting of Bituminous Coal Research, Inc., at the Deshler-Wallick Hotel Feb. 7. Improved methods of handling and using coal and development of new coal products will be discussed. Locomotive and mining development programs will be featured at an exhibit.

Dr. Mehl Takes U. S. Post

Pittsburgh—Dr. Robert F. Mehl, director of the Metals Research Laboratory and head of the Dept. of Metallurgical Engineering at Carnegie Institute of Technology, has been appointed chairman of the Metallurgical Advisory Board of the government's National Research Council.

KEMP
Immersion Melting Pots melt metals at Lowest Cost

• 44" pot with 10,000 lb. capacity.
• Casting rate: two tons per hour.
• Estimated fuel savings of up to 40%.



• Newspapers report actual savings of from 50% to 60% on fuel with 10-ton capacity melting pot shown above.

SAVE YOU UP TO 40% ON FUEL ALONE

If you melt soft metals, lead, pewter, tin or salt, you can now cut your melting costs to rock bottom. Actual cases prove that modern Kemp Gas-Fired Immersion Heating cuts fuel bills up to 40% and more. Reduces heat recovery time to 1/3—assures high thermal efficiency for both large and small units.

POSITIVE HEAT CONTROL

There's no brickwork to steal heat—no external combustion chamber — no carbon monoxide—no temperature overrun. You get high melting rates, reduced dross formation and speed of temperature recovery after adding cold material. The Kemp Industrial Carburetor, part of each installation, assures complete combustion—reduces installation costs.

SEND FOR DETAILS

Get the facts. Find out how much you can save — how Kemp Immersion Melting Pots can improve your melting operation.

KEMP OF BALTIMORE IMMERSION MELTING POTS

Write for Bulletin for technical information.
Address: C. M. KEMP MFG. CO.
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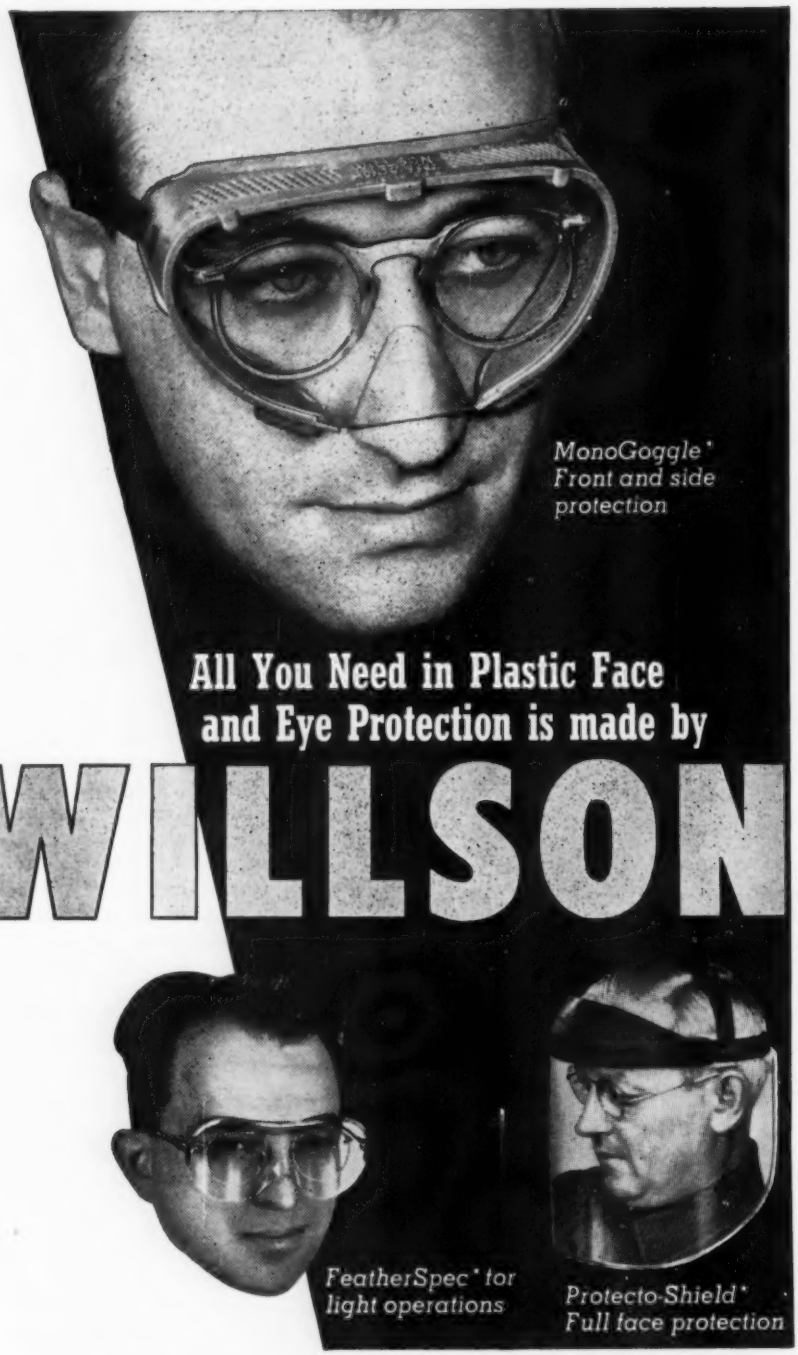
CARBURETORS • BURNERS • FIRE CHECKS • ATMOSPHERE & INERT GAS GENERATORS
ADSORPTIVE DRYERS • METAL MELTING UNITS • SPECIAL EQUIPMENT



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Dependable Products Since 1870

These three types of protective devices, all with one-piece plastic lenses or visors and each with many variations, give you a wide selection to meet specific requirements of work hazards. Their light weight and comfortable fit insure workers' willingness to wear them for long hours on the job. Complete information on plastic protection and other eye and respiratory safety equipment is available in the new WILLSON catalog. Get your copy from our nearest distributor or write direct to WILLSON PRODUCTS, INC., 231 Washington Street, Reading, Pa.

*T.M. Reg. U.S. Pat. Off.

Carpenter HR Mill Planned To Boost Schuylkill River Output

Reading, Pa.—Construction of a new $3 million hot-rolling mill at Carpenter Steel Co.'s plant on the Schuylkill River is expected to start within the next 3 months.

The new mill, combining production of strip, bar and rod, will be in operation in 1952. Carpenter, important alloy steel producer, will be able to perform conversion operations now done for it by other mills.

Electrical equipment will be furnished by General Electric and Westinghouse, and mill equipment by Birdsboro Steel Foundry & Machine Co.

Steel Strip Mill to Japan

Pittsburgh—The nucleus of a modern continuous steel strip mill plant will be supplied to Nichia Steel Works Ltd., of Kobe, Japan, by the Lewis Foundry & Machine Div. of Blaw-Knox Co., which has received a $1 million plus order for equipment and engineering services.

Lewis will provide seven of 11 flat-rolling mills, including a series of six 4-high finishing mills and one 2-high mill, plus auxiliaries; also the design and engineering for the remaining mills, four edging stands and mill accessories and related equipment.

Moore Announces Expansion Plans

Bridgeport, Conn.—A $250,000 plant expansion program by the Moore Special Tool Co., Inc., has been announced by Richard F. Moore, president. The expansion will add 15,000 sq ft of floor space. Mr. Moore is one of the founders and a former president of the National Tool & Die Mfrs. Assn.

Armour Research to Expand

Chicago—Spurred by war needs, Armour Research Foundation of Illinois Institute of Technology has announced a 30 pct expansion of facilities for research in gasoline and diesel engines, lubricants, and heat transfer.

Weirton Names Ross Manager Of Labor Relations Department

Weirton, W. Va.—Edward A. Ross, former president of the defunct Weirton Independent Union, Inc., which represented Weirton Steel Co. employees in labor negotiations, has been appointed manager of labor relations of the company.

Ross, an employee in Weirton's strip steel department for 18 years, was president of the WIU from 1946 until 1950, when the union was disbanded by federal court order. This union was succeeded by the Independent Steelworkers Union, which won collective bargaining rights over the United Steelworkers of America, CIO.

NE Industry Advised to Expand

Hartford—A vigorous program of industrial plant and equipment "face-lifting" for New England manufacturers is advocated by Walter H. Wheeler, Jr., president of the New England Council.

Mr. Wheeler, president of Pitney-Bowes, Inc., believes New England is not planning enough plant expansion to maintain its competitive position.

ASLE Convention April 16-18

Philadelphia—Internal combustion engineers from some of the country's leading automotive and petroleum producing companies will take part in a panel on Diesel power at the convention of the American Society of Lubrication Engineers here Apr. 16 to 18. The meeting will be at the Bellevue-Stratford Hotel.

Union Pacific Orders 1000 Cars

Omaha, Neb.—Plans to build 1000 new freight cars during 1951 at a cost of $6½ million, have been announced by A. E. Stoddard, president of Union Pacific R.R. Freight car orders during the past year total 8500. Union Pacific's freight car program to date, including cars on order, now totals more than $50 million.

"Don't overlook a look under!"
see why the Stuebing Hydrolectric needs only ¼ average maintenance
It pays to "get to the bottom" of lift truck maintenance problems. The smart truck buyer knows the heart of a lift truck is the drive and makes sure he gets the best, most dependable drive available.
Only in Stuebing Hydrolectric do you get this rugged construction . . . this positively trouble-free service . . . the Stuebing True Differential Drive. Alloy steel gears and running parts are sealed in lubricant. Old style chain drives are eliminated.
Of course the Stuebing Hydrolectric saves up to 80% on time and work in material handling. But, remember, in addition, users report it does the work at ¼ the cost . . . lasts 4 times longer. Want the facts? Write today for Bulletin Y.
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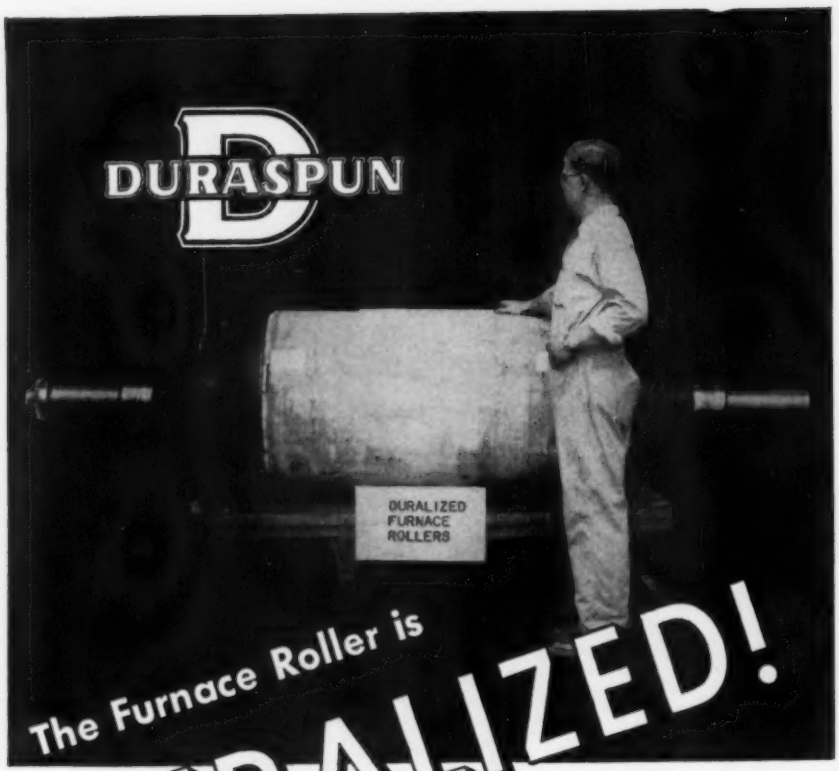


And what is "Duralizing"?

It's a surface treatment given to the casting

1 . . . to make it more resistant to abrasion

2 . . . to make it more resistant to molten metal

3 . . . to minimize "pick up"

This is a treatment we developed in our own laboratory and foundry to meet special conditions for certain furnace operations. Normal high alloy castings would withstand the heat all right but abrasion, erosion and pick up were something else again. The "Duralized" Rolls solved the problem.

While you may not need a high alloy casting calling for the Duralizing treatment, you may have a high alloy casting problem. We'll be glad to study it with you and recommend the alloy and type of casting best for your requirements.

THE DURALOY COMPANY

Office and Plant: Scottdale, Pa. • Eastern Office: 12 East 41st Street, New York 17, N.Y.

Atlanta: J. M. TULL Metal & Supply Co. — Detroit: F. B. CORNELL & ASSOCIATES — Chicago: F. O. NELSON 1743 McCormick Building — San Francisco: JOHN D. FENSTERMACHER

METAL GOODS CORP: Dallas • Denver • Houston • Kansas City • New Orleans • St. Louis • Tulsa

Plan New West Texas Oil Line

Pittsburgh — A 440-mile 26-in. diam. crude oil pipe line will be built by Gulf Oil Corp. and four other oil companies to make more West Texas oil available to refineries on the Gulf Coast, the Ohio Valley and Great Lakes region.

Gulf Oil has filed plans with the Petroleum Defense Authority for the line, which will have an estimated daily capacity of 300,000 bbls. Associated with Gulf are Cities Service, Pure Oil, Sun Oil and Standard of Ohio.

Work will get underway in late summer or early fall with completion early in 1952. The line will have a connection in Eastern Texas to north-bound crude lines serving the Ohio and Great Lakes areas.

Form ASTE Book Committee

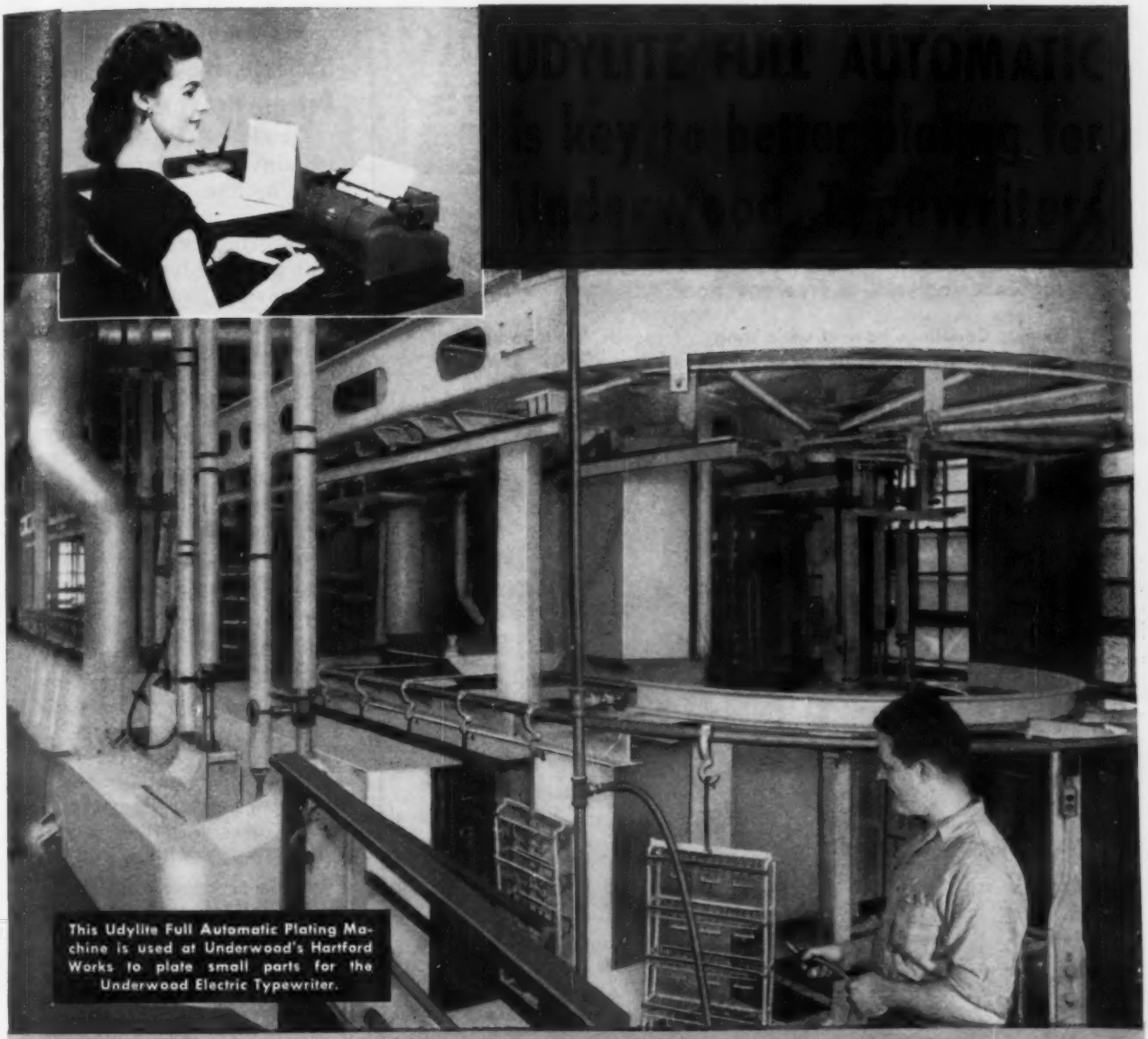
Detroit—The American Society of Tool Engineers has formed a new "A.S.T.E. Book Committee" to replace its former ASTE Handbook Committee. The new committee will determine fields of industrial production in which specialized tooling information is required and develop books and manuals under its supervision.

Chicago Firm Wins ISIS Award

New York—Iron & Steel Products, Inc., Chicago, won first place in the 1950 safety contest of the Institute of Scrap Iron & Steel. The Chicago firm was credited with 44,690 accident-free manhours. Second place went to Abrams Metal Co., Philadelphia, and third place to Mervis Iron & Metal Co., of Danville, Ill.

Unions Sign Longer Contracts

New York—Unions are signing more long-term labor pacts with provisions for some method of altering wages, according to a survey of 229 contracts completed by the National Industrial Conference Board. A "decided shift" to contracts longer than a year took place after outbreak of the Korean war but was evident previously.



This Udylite Full Automatic Plating Machine is used at Underwood's Hartford Works to plate small parts for the Underwood Electric Typewriter.

Another great name in American Industry—the Underwood Corporation—has found Udylite equipment and processes supply a ready answer to plating problems. Underwood reports—since installation of their new Udylite Full Automatic Plating Machine for Bright-Nickel application to typewriter parts—that rejects have been virtually eliminated and hand buffing operations on many small parts are now no longer required. This is in addition to a substantial saving in manpower over their previous equipment.

The Udylite Full Automatic offers: (1) Modern, simplified design for easy maintenance; (2) Rugged, integrated frame and base for rapid installation and long-lived durability; (3) Hydraulic lift and transfer mechanism for smooth, efficient operation; (4) Independent lift and transfer controls for meeting various plating requirements.

These and many other advantages have made Udylite equipment the first choice of platers everywhere. Let your Udylite Technical Man show you how Udylite methods and machines can bring tangible benefits to your plating operations. Call him in today. There's no obligation. Or write direct to *The Udylite Corporation, Detroit 11, Michigan.*

PIONEER OF A BETTER WAY IN PLATING

THE Udylite CORPORATION
DETROIT 11, MICHIGAN

THOMAS *Flexible* ALL METAL COUPLINGS

FOR POWER TRANSMISSION • REQUIRE NO MAINTENANCE

Patented Flexible Disc Rings of special steel transmit the power and provide for parallel and angular misalignment as well as free end float.

Thomas Couplings have a wide range of speeds, horsepower and shaft sizes: ½ to 40,000 HP — 1 to 30,000 RPM.

Specialists on Couplings for more than 30 years

PATENTED FLEXIBLE DISC RINGS

BACKLASH FRICTION WEAR and CROSS-PULL are eliminated LUBRICATION IS NOT REQUIRED!

THE THOMAS PRINCIPLE GUARANTEES PERFECT BALANCE UNDER ALL CONDITIONS OF MISALIGNMENT.

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NO MAINTENANCE PROBLEMS.

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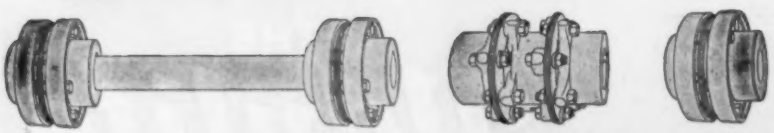
ALL PARTS ARE SOLIDLY BOLTED TOGETHER.



Write for the latest reprint of our Engineering Catalog.

THOMAS FLEXIBLE COUPLING CO.
WARREN, PENNSYLVANIA

Shortage, Higher British Defense Needs to Force Zinc Cuts

London—Further cuts in British zinc consumption were promised by the Minister of Supply who announced in Parliament that the shortage was not easing and that the supply of zinc, ordinary grade, may have to be restricted to about 50 pct of the rate of use during the first 9 months of 1950.

The effective date of the Statutory Order prohibiting the use of zinc and copper for certain manufactures has been put forward to March 1. A further concession is that users will have until July 1 to use up stocks.

Credit Curbs Hit Auto Sales

Detroit—Government credit restrictions have taken their toll as shown by November new car registrations which declined 130,000 units while trucks fell off 13,000 units from October, reports R. L. Polk & Co., statisticians. Polk estimates new car registrations in '50 as over 5 million and truck sales near 1.1 million units.

Soil Pipe Makers Agree on Sizes

Birmingham — Industry-wide standardization of cast iron soil pipe sizes is expected to follow a meeting here of the technical committee of the Cast Iron Soil Pipe Institute and the standardization committee of the National Assn. of Master Plumbers.

Institute Elects Wernisch

Chicago—George R. Wernisch of Ceco Steel Products Corp., has been elected chairman of the Metal Roof Deck Technical Institute. Other officers are: E. Klein, U. S. Gypsum Co., vice-chairman; E. A. Miller, Detroit Steel Products Co., secretary-treasurer.

Steel Casting Shipments Off

Washington—Shipments of steel castings in November were 146,000 tons, down slightly from the October figure of 150,000 tons. Unfilled orders at the end of November reached a total of 538,000 tons.

Now available for oil hardening in entire range of thicknesses...

Brown & Sharpe Ground Flat Stock

To give you even greater benefits from the money-saving, time-saving advantages of accurately pre-ground stock, Brown & Sharpe offers a choice of oil or water hardening steel in 16 different thicknesses from 1/64" to 1".

In eight thicknesses up to and including 3/16", a single type of ground flat stock now serves for hardening in either oil or water . . . a distinct Brown & Sharpe feature.

With this complete range of 145 stock sizes, you can meet a wide variety of requirements. Stock for oil hardening is for parts with intricate sections, sharp corners or abrupt changes in form . . . for water hardening, where slightly higher hardness is needed.

Continuous, repeat markings of type on each piece of Brown & Sharpe Ground Flat Stock make identification easy. Protective envelopes in different colors simplify handling.

Write for new descriptive folder. Brown & Sharpe Mfg. Co., Providence 1, R. I., U. S. A.

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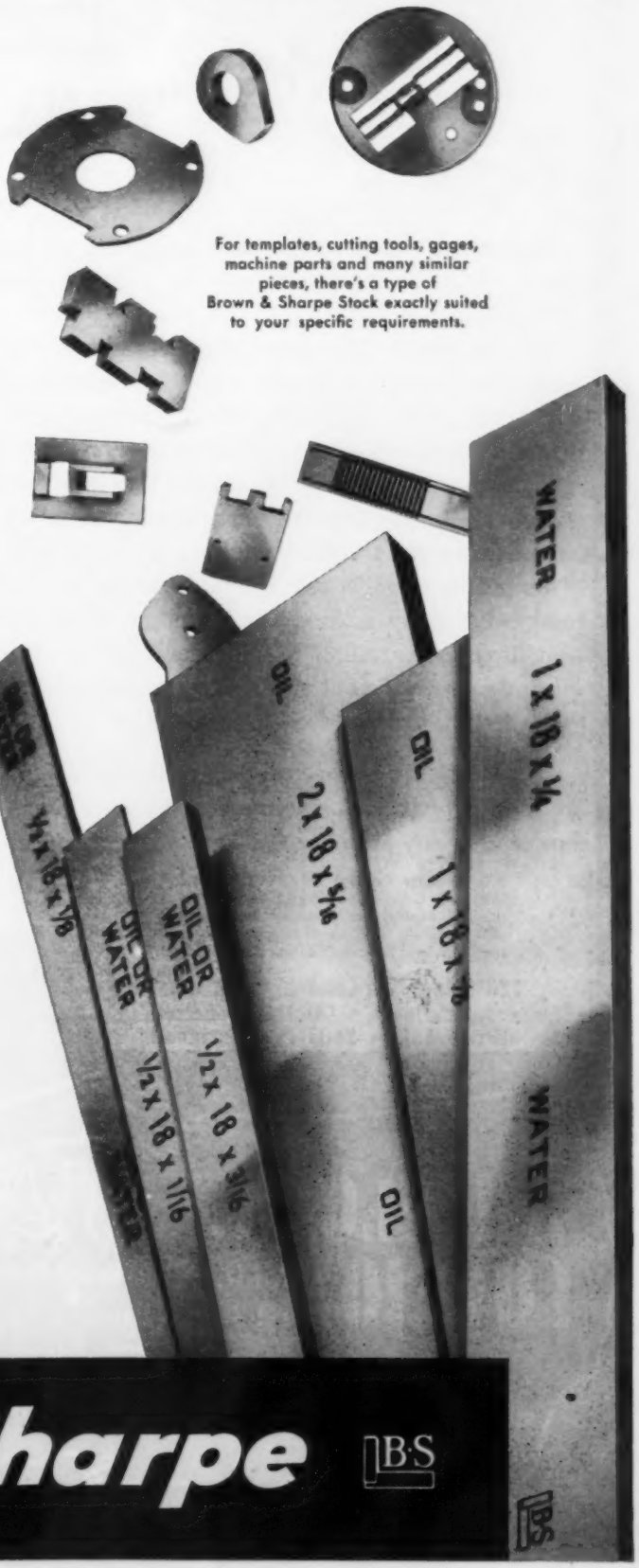
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even tempered, *but* TOUGH!

HY-TEN

"B" No. 3X

If you need even temper and toughness on heavy-duty parts, by all means investigate the unusual properties of HY-TEN "B" No. 3X!

WL can supply "B" No. 3X in bars, discs, flats or forgings heat treated to your exact hardness specifications. And this unusual HY-TEN alloy steel can be machined even when hardened as high as 477 Brinell (48 Rockwell "C")!

This unusual property—*machinability at high degrees of hardness*—makes this steel particularly well suited for parts which are apt to distort badly in the treating operation. This makes possible savings in handling and set-up time and finishing operations by putting parts into service without further treatment. A smoother finish is obtainable at almost any degree of heat-treated hardness than is possible with standard alloy steels.

WL *steels are metallurgically constant. This guarantees uniformity of chemistry, grain size, hardenability—thus eliminating costly changes in heat treating specifications.*

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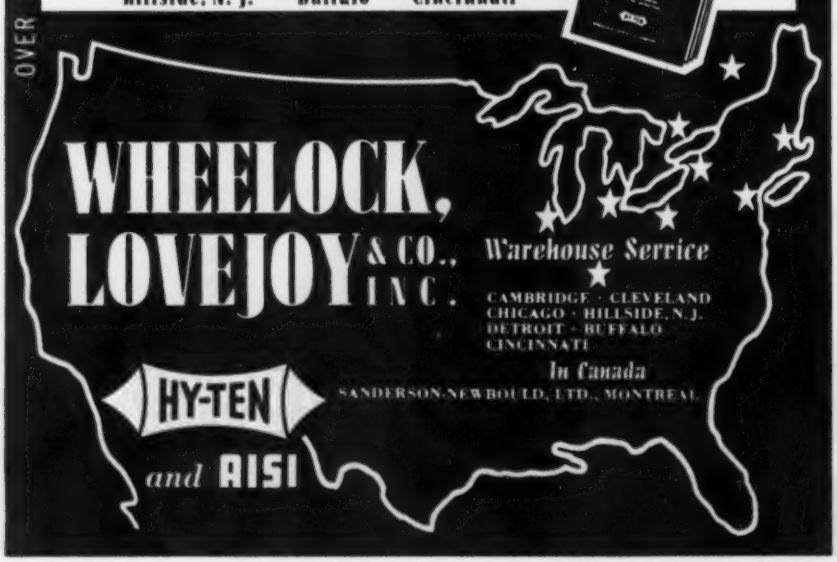

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HY-TEN *and* AISI

Heppenstall to Boost Steel Forging Output with Other Plant

Pittsburgh—To speed production of steel forgings for defense, The Heppenstall Co. has taken over a plant at New Brighton, Pa., and will coordinate facilities there with production in its Pittsburgh works.

Heppenstall purchased the William Leard Corp. plant from the Harkit Corp. of Pittsburgh.

Plant Sets Safety Record

LaGrange, Ill.—A new national record for heavy industry operation without a lost time accident has been set by Plant No. 3 of Electro-Motive Div. of General Motors at Cleveland. Employees at the plant worked 5,294,960 hr without a lost time accident. The record was set between May 9, 1949, and Dec. 11, 1950, covering a calendar period of 588 days. The previous record, set in 1941 by the Wilmington, Del., plant of the Pullman Co., was 4,265,572. The new record was recognized by the National Safety Council on Jan. 3.

ADCI Plans For Doehler Award

New York—Nominations for the annual Doehler Award of the American Die Casting Institute are being received between now and April 30, the Institute has announced. The award, a plaque and $500, will be made at the annual meeting in September.

Any individual, group, or technical society is eligible, whether or not engaged in the die casting business.

Cobalt Production Swings Up

New York—United States and Canadian production of cobalt, stringently rationed component of magnet metal, will total 4¼ million lbs by the end of 1952, according to the American Institute of Mining and Metallurgical Engineers. U. S. cobalt use prior to June, 1950, was 8 million lbs annually, 90 pct imported from Belgian Congo.

Design, Fabricating Firms Merge Into Salem-Brosius, Inc.

Pittsburgh—The Edgar E. Brosius Co., of Pittsburgh and the Salem Engineering Co., Salem, Ohio, have merged and will be known as Salem-Brosius, Inc. But individual company identifications will be retained for business purposes.

The merger was announced in a joint statement by Ward A. Wickwire, Sr., president of Brosius, and Sam Keener, president of Salem Engineering.

Government Information Offices

Washington — Three new field offices of the Commerce Dept. have been opened in the United States and another in Puerto Rico to handle priority matters, allocations, small business programs, to guide business in interpreting NPA orders, and provide U. S. procurement information.

Locations of the new offices are: 507 Strauss Bldg., 809 South Calhoun St., Fort Wayne, Ind.; 251 Sonna Bldg., Main St., Boise, Ida.; Davenport Institute, 4 Fulton St. East, Grand Rapids, Mich.; and 2 Puerto Reconstruction Administration Ground, Bldg. N, San Juan, Puerto Rico.

Modification Center to Reopen

Birmingham — The Bechtel-McCone aircraft modification plant here, built by the government during World War II at a cost of $13 million, will be re-opened soon.

The announcement by Under-Secretary for Air John A. McCone apparently means Chase Aircraft Company of West Trenton,, N. J., which had leased part of the plant for manufacture of cargo aircraft, may lose its lease.

Electric Maintenance Meeting

Milwaukee — The Electrical Maintenance Engineers of Milwaukee will hold their 12th annual Industrial Electrical Equipment Exposition here on Feb. 1 and 2. On display will be equipment from 65 manufacturers.

Ⓑ Special Ladder Bolt

Won't let you down...whether it's of wood or metal fabrication there's a place for Ⓑ Special fasteners. Many wooden products such as ladders, chairs, beds and tables get their strength from the Ⓑ line of bolts. Your problems cheerfully become ours when it comes to special bolts and headed rods.

Bolts...by the Carton or Carload

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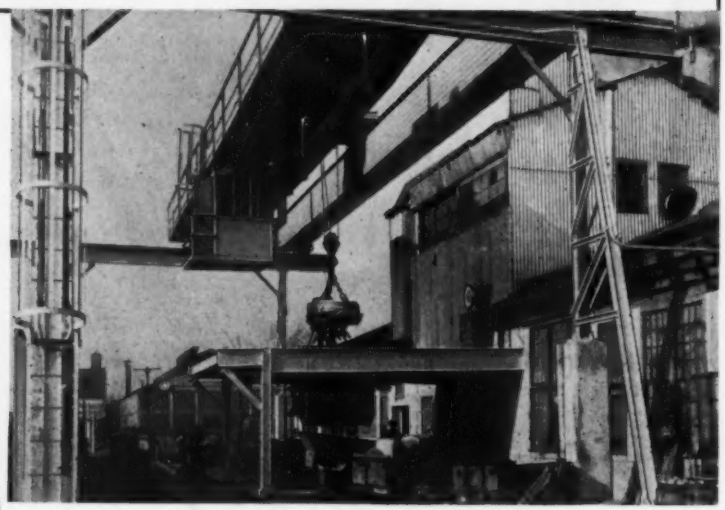
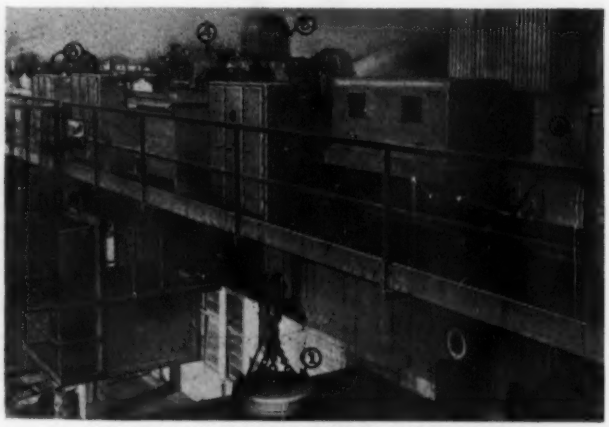
Our Specialty is "SOMETHING SPECIAL"

WHEN BUYING MAGNET CRANES SPECIFY EC&M CONTROL AND MAGNETS



EC&M Control is a complete line and built to meet all requirements—short or tall controllers to suit headroom—standard or under-lever master switches for front or rear of cage mounting—accelerating, plugging and speed-limiting systems of control that result in simplicity and safe operation. Control—the vital small cost of a crane. Specify EC&M Control.

THESE PRODUCTS IMPROVE CRANE PERFORMANCE IN MANY WAYS



KEY TO EC&M UNITS SHOWN IN ILLUSTRATIONS

1. All-Welded Lifting Magnet
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4. Type WB Brake
5. Youngstown Safety Crane-Hoist Limit Stop
6. Frequency Relay Controllers for Bridge and Trolley Motions

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publications

Continued from Page 36

booklet discusses the use of cast brass brush-holders, stainless steel springs and the unique construction of the end turns. Types, enclosures and mountings for many different applications are shown. *Westinghouse Electric Corp.*

For free copy insert No. 8 on postcard, p. 37.

Bending Manual

"It's Easy to Bend" is the title of a new 32-p. bending manual. Numerous illustrations show Di-Acro benders; the ideas contained in the booklet apply to any rotary type bending machine and should be of value to anyone interested in the bending of metals. Standard radius and tube forming accessories are described, with information on rod parters, Ejectomatic gage, and units for notching, bending, punching and shearing. Detailed descriptions of numerous standard bending procedures are presented. *O'Neil-Irwin Mfg. Co.*

For free copy insert No. 9 on postcard, p. 37.

Data on Lubricants

Combining both technical data and historical information about the company, a new 24-p. brochure traces Brooks' history from its beginning as a lamp oil producer to its position today as one of the largest compounders of industrial lubricants. Included in the technical section are details on Leadolene, Klingfast and Roll Oil F. Case histories are cited which indicate how these lead-base lubricants have compared with other products on such applications as open and enclosed gears, corrosion protection, rolling mills, circulating systems, bearings, leaking gear cases, railroad switchplates and track curves, gear reductions and wire drawing machines. *Brooks Oil Co.*

For free copy insert No. 10 on postcard, p. 37.

School Lab Machines

Four new bulletins describing G-E ac and dc rotating machines for school laboratories group 19 motor generator sets for instructional purposes into four broad classifications. Quick evaluation of the suitability of these sets for each school's particular needs can be

made more easily and more accurately. The bulletins cover motor generator sets for the study of dc machines, synchronous machines, ac motors and dc exploring coil sets for oscillograph studies in dc armatures. *General Electric Co.*

For free copy insert No. 11 on postcard, p. 37.

Metallic Bellows Info

How many common types of bellows and methods of attaching end fittings are available? Is stainless steel, nickel or brass the material most frequently used? What affects the choice of material? How can you double the flexibility and halve the spring rate of a bellows? How can you limit the total pressure generated by a bellows at a specified temperature? These and many other questions are answered in an 8-p. bulletin entitled "What to Consider When Selecting A Metallic Bellows." The bulletin contains charts, diagrams, applications, and a detailed analysis of bellows construction, materials and flexibility. *Clifford Mfg. Co.*

For free copy insert No. 12 on postcard, p. 37.

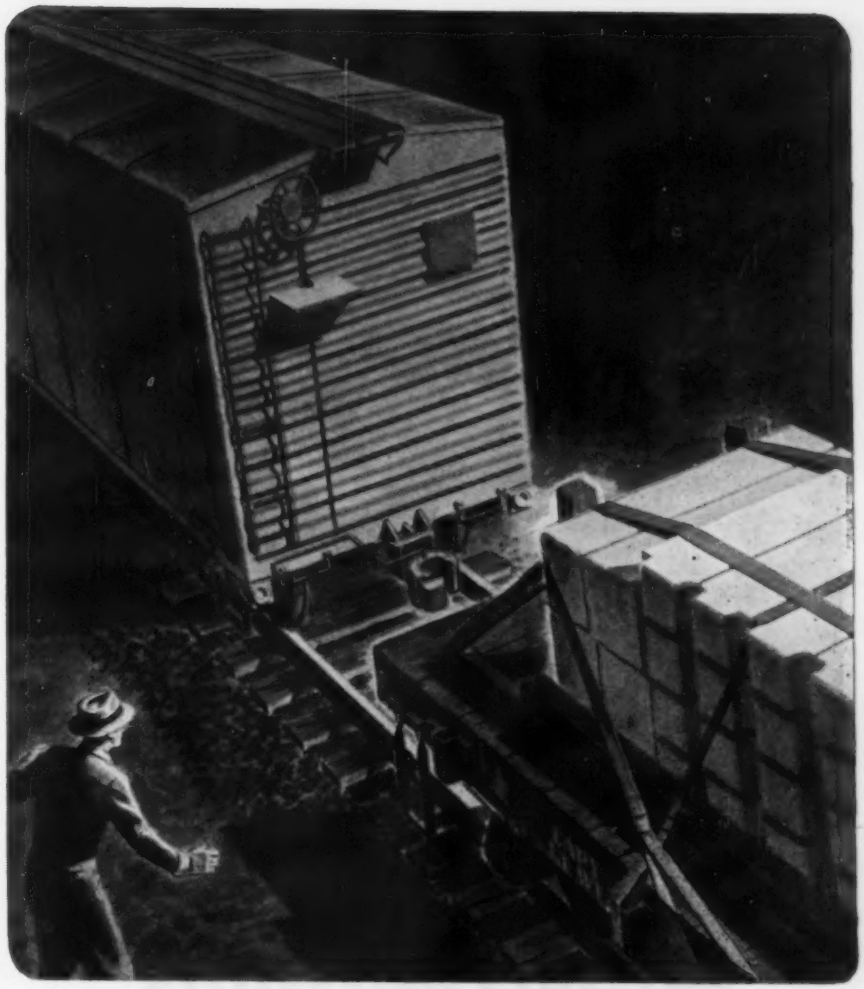
Testing Machines

A new 30-p. catalog on Riehle screw power universal testing machines and accessories includes illustrations, details of construction, specifications and dimensions of testing machines up through 400,000 lb capacity. Information is also given on special tools, instruments and accessories for special tests. *Riehle Testing Machines Div., American Machine & Metals, Inc.*

For free copy insert No. 13 on postcard, p. 37.

For Steel Handling

Featured in a new straddle truck catalog is the Hyster Model MHS, especially designed for handling steel. A variation of the standard 30,000 lb capacity Model MH straddle truck, the new model is intended for extreme service encountered in materials handling in the metal working industry. Principal among the number of improvements for extended utility shown in the booklet are double-row roller chains in the hoist mechanism; solid bar rather than channel sections in the lifting links; additional carrying capacity of the suspension springs; heavier frame in the cross members



CRASH AHEAD! . . .

ON AMERICA'S SHORTEST RAILROAD

Imagine a railroad crew that purposely sets up a crash between two loaded freight cars! That's what's happening in the scene above, and it goes on all the time—for this is Signode's famed outdoor test track.

The big idea behind this activity is to find out . . . under operating conditions . . . exactly what happens to your shipments in transit; what causes product damage; and what to do about it.

Research is the heart of Signode

as evidenced by this type of full-scale laboratory equipment. To more than 30,000 shippers, Signode's leadership in the development of better ways to make steel strapping . . . and to use it . . . has meant millions of dollars saved.

If you are engaged in defense or essential civilian production, it will be to your advantage to get the whole story. For now, if ever, the best use of men and materials, the quickest, surest way of distributing goods, is the first order of the day.

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fast, agile, highly maneuverable • outstanding design
compact, rugged construction • touch-button control
transports 4,000-lb. loads • smooth hydraulic lift
positive-action brake • raises heavy loads rapidly
dual rubber trailer wheels • powerful electric drive

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TOWMOTOR EXHIBIT
BOOTHS 322-323
1951 MATERIALS HANDLING EXHIBITION
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Chicago, April 30—May 4

MODEL "W" ELECTRIC PALLET TRUCK

TOWMOTOR GIVES YOU

more features

Any way you look at it, the Towmotor Model "W" Electric Pallet Truck is an engineering achievement packed with cost-cutting features for fast, safe, easy handling of loads up to two tons. Its great versatility is being proved in every type of manufacturing. Learn how this efficient electric truck can help cut *your* handling costs. Write for the comprehensive booklet shown in coupon.

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Please send the new free booklet, "AN ENGINEERING ACHIEVEMENT," giving complete cost-saving details of the Model "W" Electric Pallet Truck.

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publications

Continued

and corner sections; and the suspension springs having added carrying capacity to accommodate consistent handling of capacity loads. *Hyster Co.*

For free copy insert No. 14 on postcard, p. 37.

Production Tools

Standard Scully-Jones production tools are described and illustrated in 11 new catalog bulletins. These new bulletins replace the company's Tool Engineering Manual 500 and any other literature previously published. The catalogs and price lists cover: Drill and tap chucks; arbors and adapters; quick change chucks; tap holders and drivers; counterbores, countersinks and core drills; adjustable adapters; sleeves and sockets; floating holders; centers; recessing tools; and work rest blades. *Scully-Jones & Co.*

For free copy insert No. 15 on postcard, p. 37.

Lab Safety Manual

The newly revised edition of a 40-p. booklet entitled "Manual of Laboratory Safety" brings the original material up to date by the inclusion of recently developed data, techniques and equipment. The new manual will prove to be useful in the implementation of complete laboratory safety programs. The original edition of this manual has been translated into many foreign languages and is widely used throughout the world. Ten commandments for laboratory safety are listed, along with information on accident prevention, first aid, fire-fighting and safety equipment. *Fisher Scientific Co.*

For free copy insert No. 16 on postcard, p. 37.

Hand and Foot Valves

A new 4-p. technical bulletin describes the Ross ¼ and ⅜ in. 880 Series hand and foot valves. Installation data, engineering drawings and explanations of interchangeability of parts and ease of modification are included. The 880 Series was developed for quick control of small cylinders and for pilot operation of master valves. *Ross Operating Valve Co.*

For free copy insert No. 17 on postcard, p. 37.

Resume Your Reading on Page 37

production ideas

Continued from Page 40

a thermal selector set at the desired temperature to which the deep well is then chilled or heated. The part under test assumes the temperature of the deep well and can then be withdrawn and checked for operation. To test small parts mounted on larger assemblies, that

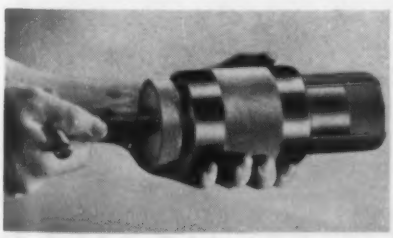
cannot be placed in the deep well, the thermal fluid can be circulated in a closed system a short distance from the test stand in insulated lines. This mobile hot-cold test stand measures 30 x 40 x 54 in. *Electro Mechanical Devices Div., George L. Nankervis Co.*

For more data insert No. 33 on postcard, p. 37.

Tube Seal

Insures foolproof seal against leakage in tube sheet closures.

A new packing and packing installation tool are special equipment for a new method of sealing tube sheet closures on heat transfer equipment for use with cor-



rosive fluid. Sealing involves no bolting or threading. The packing itself is molded composition to match the service. Thrust of the tool's cylindrical blade into the packing's annular space and against the filler ring results

● The most all-around satisfactory fastener you can use, with maximum strength, excellent *working* qualities and good appearance. Size and shape are held to remarkably close tolerances. Double heat treating adds the final value to this fine product produced by the Kaufman Double Extrusion Process. It pays you to specify and buy Cleveland High Carbon Heat Treated Cap Screws.

THE CLEVELAND CAP SCREW COMPANY
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Warehouses:
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CLEVELAND *Top Quality* **FASTENERS**

ORIGINATORS OF THE KAUFMAN DOUBLE EXTRUSION PROCESS
Specialists for more than 30 years in
CAP SCREWS, SET SCREWS, MILLED STUDS
Ask your jobber for Cleveland Fasteners

production ideas

Continued

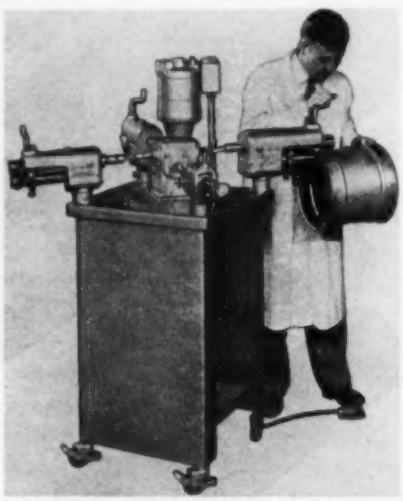
in distention of the packing, enabling it to pass over the end of the exchanger tube and be inserted in the tube sheet opening. With removal of the blade, the packing recovers its shape, thereby exerting its sealing pressure radial to the axis of the tube along the length of the filler ring. *Greene, Tweed & Co.*

For more data insert No. 34 on postcard, p. 37.

Multi-Drive Power Table

For rotary sheet metal work.

Hand operated bench machines are instantly converted to power machines with the multi-drive table. The portable welded steel table has positions for four machines. An electric foot treadle controls



the driving motor, leaving the operator's cranking arm free so that both hands can be used to guide the work in the rolls. The power unit is a Niagara worm reduction unit mounted on anti-friction bearings and operating in a bath of oil. The table comes complete with eight steel universal joints, four coupling shafts and all eletrical equipment. *Niagara Machine & Tool Works.*

For more data insert No. 35 on postcard, p. 37.

Hydraulic Eye Bender

Largest OD of eye which can be bent —with stationary mandrel—is 6½ in.

The spindle of the new hydraulic eye bender is actuated by a hydraulic cylinder with rack and pinion. Reversal is accomplished by a solenoid-operated valve which is

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Stainless · Monel
Alloy Steels
BOLTS NUTS
STUDS
Here's a full line of bolts, nuts and studs in all types of metals. Accurately threaded to assure a uniform Class 3 Fit, Pawtucket products are made in standard dimensions or to your specifications.
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Use Headed and Threaded Fasteners for Economy and Reliability
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THE PLACE TO SOLVE YOUR BOLT PROBLEMS
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controlled by a limit switch adjustable to vary the degree of rotation of the bending spindle. The hold down clamp is hydraulically actuated and arranged so that the clamping of the stock is completed before the bending spindle is ro-

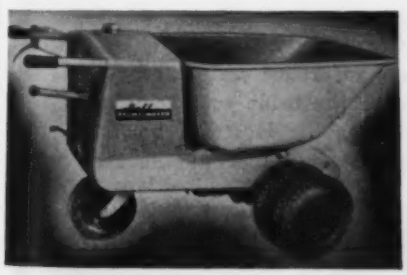
tated. Control for single cycle or continuous operation is by a foot-button mounted on a flexible cable. The machine has a recommended capacity of bending 1 in. diam round stock, hot, around a 1½ in. mandrel. *Williams-White & Co.*

For more data insert No. 36 on postcard, p. 37.

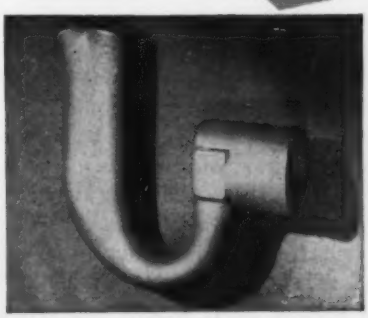
Powered Wheelbarrow

Compact, maneuverable, with rugged chassis and increased capacity.

Capacity has been increased to 1500 lb, bucket or platform load, in the improved Model 15 Prime-Mover powered wheelbarrow. Other new features include forward di-



rect drive with half speed reverse under power; dependable 5 hp Wisconsin engine; constant mesh transmission; and conveniently placed operator's controls. The engine and gasoline tank are located in an enclosed panel on top and at rear of the chassis. Two sizes of plat-



This tough, Well-Cast magnesium portable tool part is typical of how light you can make *your* product. It weighs only a few ounces.

Want to lose some weight?

40 years' experience

ALUMINUM AND MAGNESIUM SAND, SEMI-PERMANENT AND PERMANENT MOLD CASTINGS. WELL-MADE WOOD AND METAL PATTERNS.

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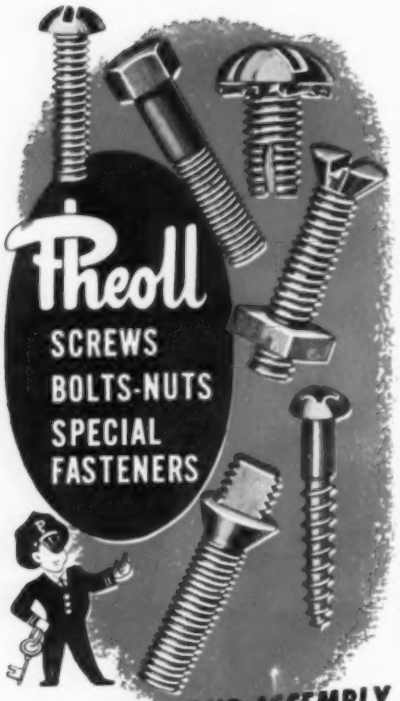

WILL KEEP YOUR ASSEMBLY LINES AT PEAK CAPACITY

Whatever you manufacture or assemble, you can speed production and improve your product by using Pheoll screws, bolts and nuts. These industrial fasteners drive easy and straight, and will not bind because threads are accurately rolled or machined. Precision-made screw and bolt heads, slots and head recesses prevent wrench and driver slippage. Count, too, the added bonus you receive by using fasteners that improve product appearance.

An interesting story on standard and special industrial fasteners and their profitable applications to your needs may be obtained from experienced Pheoll engineers. Ask these men to recommend screws, bolts and nuts that will increase your overall profits on assembly line work.

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Tapping Screws • Cap Screws • Sems • Phillips Recessed Head Screws and Bolts • Machine Screws • Special Fasteners • Thread Cutting Screws

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SCREWS • BOLTS • NUTS
Industrial Fasteners and Holding Devices

production ideas

Continued

forms with stakes are quickly interchangeable with the bucket. Turning radius is 33 in. The unit is 31½ in. wide permitting easy access through doorways and on elevators. *Prime-Mover Co.*

For more data insert No. 37 on postcard, p. 37.

Redesigned Pul-Pac

Handles unit fork-truck loads without use of conventional pallets.

Principal design change from the early Pul-Pac is the adoption of a pantograph-type linkage to actuate the gripper-jaw and pusher rack. The new construction allows a shorter hydraulic stroke, eliminating bending stresses to which the long pistons were subjected. The pantograph absorbs strong side forces formerly exerted on the long pistons. Pul-Pac structure back of the uprights is eliminated, contributing to maximum visibility and safety for the driver. *Clark Equipment Co.*

For more data insert No. 38 on postcard, p. 37.

Crankshaft Grinder

Refinishes shafts up to 18 ft long.

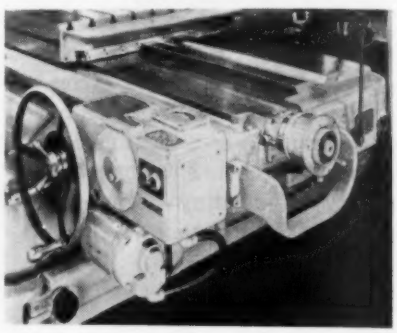
The principle of the moving grinding wheel is incorporated in a 20-ton grinder for regrinding diesel crankshafts. The supersize machine reportedly can chuck up and grind an 18-ft diesel shaft with ease and precision. The 4½-ft diam grinding wheel, on the largest model, is moved hydraulically on precision ways from journal to journal at selected speeds from 1 to 35 ipm. Hydraulic controls are also used to give rapid, smooth approach and retraction to the grinding wheel. Adjustment for various lengths of crankshafts is made through movement of the headstock, with the final setting made at the tailstock through an adjustable quill. Head and tailstock spindles are mounted in 12½ in. Timken OD bearings. Shaft is held by 24-in. pot chucks and main bearings are ground between centers. The overall height is 7 ft; work is placed at eye-level. Electrical controls are at the operator's finger tips. Three models are available accommodating crankshaft swings varying from 32 to 50 in. and lengths from 108 to 216 in. Grinding wheel diameters range from 36 to 54 in. with widths from 1 to 5 in. *Lemco Products, Inc.*

For more data insert No. 39 on postcard, p. 37.

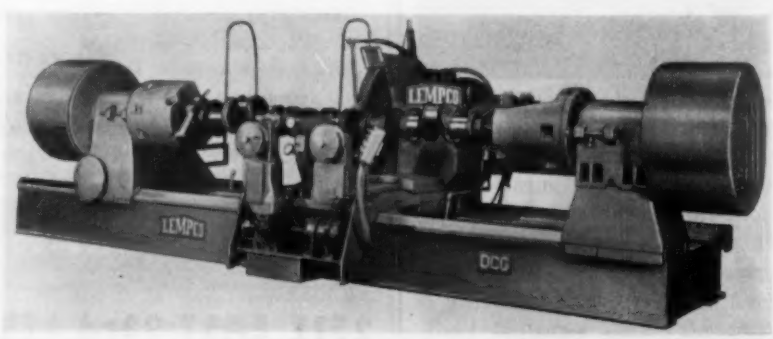
Measuring System

For precision location of table and work on P & W jig borer.

Accurately locating large work under the machine spindle on the P & W No. 4E jig borer is facilitated by a measuring system based



on the P&W Electrolimit gaging principle. Basic 1-in. spacing is obtained from a master measuring bar by electrical means, without making physical contact with the bar. Two master bars are built into the machine at right angles with one another, one for positioning longitudinally and one for positioning transversely. Cylindrical reference scales are used to locate the table to approximate settings. To locate a hole, the micrometer is set at the inch frac-



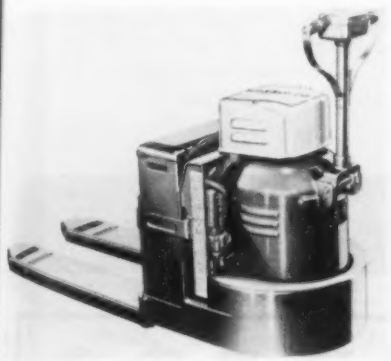
tion and the power rapid traverse operated until the reference scale reads the approximate setting. Final adjustment is made by handwheel. All scales read from zero in either direction and are adjustable to set zero for a starting position. Locating can start from either end or from the center of the work. *Pratt & Whitney, Div. Niles-Bement-Pond Co.*

For more data insert No. 40 on postcard, p. 37.

Electric Pallet Truck

Compact, powerful; handles pallet loads weighing 4000 lb maximum.

Among the advanced features of the Model W pallet truck are a new contactor panel, a positive-action brake with foolproof dead-man control, improved differential action, and all-rubber, dual trailer



wheels for smoother operation. Operator controls are located for finger-tip operation with right or left hand. A key switch provides positive turn off of power to the dual control buttons. Other features include smooth hydraulic lift, the rapid raising of heavy loads, powerful electric drive, and fast, agile maneuverability. *Towmotor Corp.*

For more data insert No. 41 on postcard, p. 37.

Goggle Padding Mask

Assures extra tight fit for better protection of worker.

A new molded rubber detachable padding mask for heavy duty coverall safety cup goggles is attached by a beaded molding that slips over the rims of the eye cups, providing a firm, light-tight joint. It is replaceable and can be changed without use of any tools. The mask may be purchased as an accessory with Willson cup goggles, or bought separately for application to goggles already in use. *Willson Products, Inc.*

For more data insert No. 42 on postcard, p. 37.

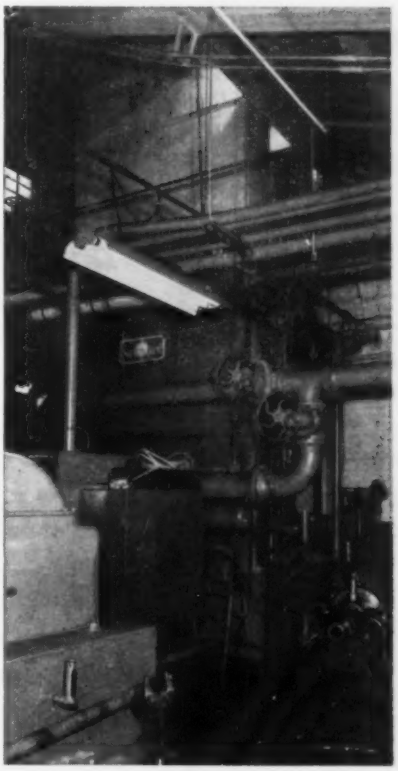
Resume Your Reading on Page 41

You Get Trustworthy Liquid or Gas Cooling With Great Cooling Water Savings from the NIAGARA AERO HEAT EXCHANGER

● You can cool air, gas, water, oils, chemicals, electric and power and process equipment, engines, mechanical processes with lower cost and really accurate control of temperature with the Niagara Aero Heat Exchanger.

You are assured of uniform, constant production and quality from any process . . . steady, reliable operation . . . lower cost for more dependable cooling. You can have closed system cooling with freedom from scale, dirt, corrosion and maintenance troubles. You can accurately cool more than one type of liquid with one machine.

The Niagara Aero Heat Exchanger uses atmospheric air to cool liquids and gases by evaporative cooling. You can remove heat at the rate of input to keep accurate control of gas or liquid temperature. You can put heat back into the system to save the losses of a "warm-up" period or to equalize the effect of load variations.



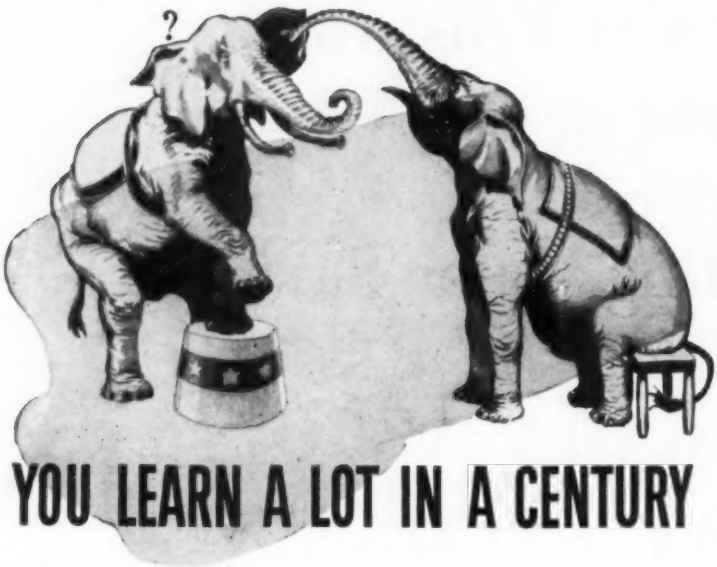
Great savings in cooling water and savings in piping, pumping and power return the cost to you quickly. The Niagara Aero Heat Exchanger can save you approximately 95% of your cooling water cost. Write for Bulletin 96.

NIAGARA BLOWER COMPANY

Over 35 Years Service in Industrial Air Engineering

Dept. 1A, 405 Lexington Ave. **New York 17, N. Y.**

Experienced District Engineers in all Principal Cities



YOU LEARN A LOT IN A CENTURY

We have . . . especially about boxes and crates, because we have been designing and manufacturing them for nearly a century.

Today we are proud to offer you SUPERSTRONG . . . the crowning product of our long experience. Here you have a complete line of tough sturdy shipping containers - custom built to your product to give maximum protection at lowest possible cost.

Send out a call for a SUPERSTRONG man - it will pay you to get the full SUPERSTRONG story.

WIREBOUND BOXES and CRATES

WOODEN BOXES and CRATES

CORRUGATED FIBRE BOXES

BEVERAGE CASES

STARCH TRAYS

PALLETS

SHIPPING SUPERSTRONG CONTAINERS

RATHBORNE, HAIR AND RIDGWAY BOX CO.
1440 WEST 21st PLACE • CHICAGO 8, ILLINOIS

PEDRICK BENDERS

Do not use Mandrels!

The illustration shows a Pedrick Machine bending a 4" Extra Heavy Pipe Cold and without a Mandrel. The radius is about three times the nominal diameter of the pipe and the flattening effect is almost unnoticeable. This machine is in the service of the Hajoca Corporation, manufacturers of plumbing supplies at their new plant in Philadelphia. The bending time is computed in seconds and the relay control duplicates the work where same is desired without manual attention. If you are interested in saving money in your pipe fabricating department, write for our illustrated folder.

PEDRICK TOOL AND MACHINE COMPANY

3640 N. Lawrence Street, Philadelphia 40, Pa.

IRON AGE *markets and prices*

market briefs and bulletins

steel bookings—Mill bookings are running fairly current on DO's since the limits were revised upwards recently. However some products are still out of kilter. One mill has openings in July for hot-rolled sheets, June for hot-rolled strip and rail steel bars. Cold-rolled sheets, tinplate and plain carbon plate are open for May. Carbon bars and reinforcing bars are open for May-June rolling. A check of other companies shows about the same. The exception is big bar mills which are booked from Sept., 1951 to Jan., 1952.

takes up option—National Steel Corp. has exercised an option to buy a 15 pct interest in Reserve Mining Co., organized to develop an industrial process for extracting iron ore from taconite. Armco Steel Corp. and Republic Steel Corp. hold the remaining interest. Reserve Mining controls deposits at the eastern end of the Mesabi Range estimated to hold 1.5 billion tons of taconite, which should yield 500 million tons of 60 pct iron ore. Present plans call for production of 300,000 tons of ore per year in the form of pellets.

adjustments in copper use—Adjustments to permit builders to use inventory stock of hardware, piping and brass mill products covered in NPA order M-12 may soon be made. This would ease the situation for home builders who under M-12 amendment 1 "may not accept for delivery of or use such product for this purpose after Apr. 30, 1951."

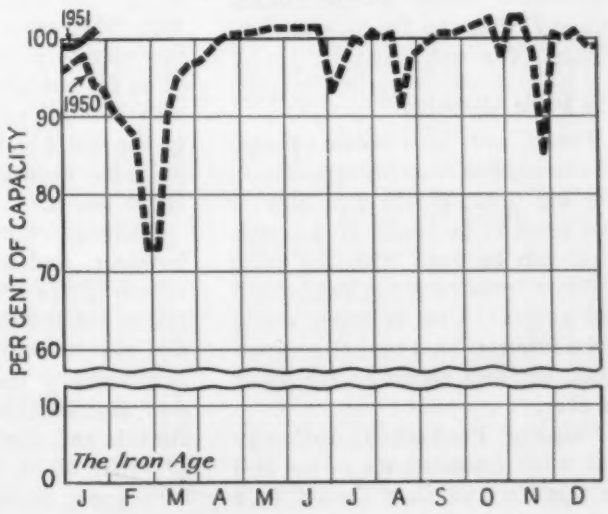
conversion—It appears that legitimate steel conversion has at least the temporary blessing of Washington. The reason is simple: Conversion represents 10 to 20 pct of total steel output today. Rather than lose this large amount of steel output Washington gave conversion the nod—for the present at least.

how urgent—If a controlled materials plan is impossible at this time, steel people would like to be advised at least of the urgency of one order as related to another. They feel that it should not be their responsibility to make the decision. On some products in certain companies the present system shows signs of bogging down.

warehouse quotas—Some warehousemen claim their allotments have been cut 25 pct overall so far this year, while on some individual products it runs as high as 50 pct. They say their biggest cuts are coming from nonintegrated steel producers. But the nonintegrated producers get their allotments from integrated mills after DO's and allocation programs are taken out. Thus what the warehouses get from the nonintegrated producers is a percentage of a percentage. Toughest items are bars and tubing.

price confusion—Dealings in tin, lead, zinc and copper futures on the New York commodity exchange were halted Monday as trading officials met in emergency sessions in an effort to clarify the murky price control situation. Traders and exchange operators were in the dark over application of the price freeze. Confusion resulted from uncertainty as to how prices would be applied, and the fact that the freeze did not consider futures orders separately.

Steel Operations**



District Operating Rates—Per Cent of Capacity**

Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	West	Buffalo	Cleveland	Detroit	Wheeling	South	Ohio River	St. Louis	East	Aggregate
Jan. 21	97.0*	100.5	96.0*	99.0	106.7	104.0	99.0*	106.0*	101.0	106.0	91.0	95.1	111.3	101.0
Jan. 28	97.0	101.5	96.5	99.0	103.8	104.0	97.0	108.0	100.0	106.0	90.5	95.1	98.0	101.5

* Revised.
** Beginning Jan. 1, 1951, operations are based on an annual capacity of 104,229,650 net tons.

nonferrous metals

outlook and market activities

NONFERROUS METALS PRICES

	Jan. 24	Jan. 25	Jan. 26	Jan. 27	Jan. 29	Jan. 30
Copper, electro, Conn. ...	24.50	24.50	24.50	24.50	24.50	24.50
Copper, Lake, delivered...	24.625	24.625	24.625	24.625	24.625	24.625
Tin, Straits, New York	$1.80	$1.83	$1.82	....	$1.83	$1.83*
Zinc, East St. Louis	17.50	17.50	17.50	17.50	17.50	17.50
Lead, St. Louis	16.80	16.80	16.80	16.80	16.80	16.80

Note: Quotations are going prices.

*Tentative.

by R.Hatschek

New York — The long-awaited price freeze is finally upon us but setting prices at record-high levels is looked upon as ridiculous by many. What is expected next is a definite price list, at least for scrap metals, in which the price for new metal will be the guide.

Just how soon the Economic Stabilization Agency will get to this is now the main subject for conjecture. Many people think, and say, that the freeze was "imminent" for too long.

Tin Price Question

There are still some points which require clearing up. Tin is one big one. Where and how is that price to be fixed? If it is not, what can be done with the price of alloys containing tin, like babbitt and solder? One solution would be an international tin price agreement, but this seems as far away as ever.

National Production Authority last week amended its order M-8 on pig tin and then issued four more orders affecting tin. They are: M-24 on tinplate and terneplate, M-25 on metal cans, M-26 on tinplate closures, and M-27 on collapsible tubes.

Other orders affecting nonferrous metals were an amendment to M-14, prohibiting the use of nickel for non-essential purposes; M-30 on tungsten; and M-33 on molybdenum. More complete details on these orders can be found in the section of this issue devoted to news.

Industry Disagrees

Following the meeting with members of the zinc industry, NPA officials indicated that they thought it might be necessary to amend order M-8 to prohibit certain "less essential" uses of zinc in order to provide sufficient supplies for the defense effort. NPA also pointed out that some users of the metal had been getting zinc on rated orders long before they could use it.

Industry members protested, however, and said that the full effects of the order have not been felt as yet and that, when they are, the zinc supply picture will be substantially improved. They expect that 90 days will be required for this and, considering all facets of order M-15, they expect it to save some 25,000 tons of zinc a month which could be used for essential production and stockpile purposes.

Nonferrous metal shortages are helping to create a very uncertain future for the auto industry. Copper, nickel, zinc and alumium restrictions are all hampering the car manufacturers, it is reported.

Detroit interests attribute the worsening copper situation to three factors—(1) A slowdown in domestic shipments, (2) the government stockpile program, and (3) late developments in Chile. Chilean producers are reported to be selling more copper to countries other than the United States. Copper is being made into deformed wire bars which can be sold more profitably in the world markets than ingots to this country.

Copper Stockpiling Needs

The Munitions Board stockpiling is taking some 15,000 to 20,000 tons of copper per month and the amount already on hand is reported to be a little more than a quarter of the minimum requirement.

William H. Harrison, Defense Production Administrator, does not paint an optimistic picture of the future of the copper industry. He mentioned the expansion taking place in the steel and aluminum industries and indicated that this would not happen with copper. Mr. Harrison stated that a controlled materials plan would be in effect by summer and said that this would be a great aid in supplying the nation's needs of this metal.

MILL PRODUCTS

(Cents per lb, unless otherwise noted)

Aluminum

(Base 30,000 lb, f.o.b. ship. pt. frt. allowed)

Flat Sheet: 0.188 in., 2S, 3S, 30.1¢; 4S, 61S-O, 32¢; 52S, 34.1¢; 24S-O, 24S-OAL, 32.9¢; 75S-O, 75S-OAL, 39.9¢; 0.081 in., 2S, 3S, 31.2¢; 4S, 61S-O, 33.5¢; 52S, 35.6¢; 24S-O, 24S-OAL, 34.1¢; 75S-O, 75S-OAL, 41.8¢; 0.032 in., 2S, 3S, 32.9¢; 4S, 61S-O, 37.1¢; 52S, 39.8¢; 24S-O, 24S-OAL, 41.7¢; 75S-O, 75S-OAL, 52.2¢.

Plate: ¼ in. and heavier: 2S, 3S-F, 28.3¢; 4S-F, 30.2¢; 52S-F, 31.8¢; 61S-O, 30.8¢; 24S-O, 24S-OAL, 32.4¢; 75S-O, 75S-OAL, 38.8¢.

Extruded Solid Shapes: Shape factors 1 to 5, 26.2¢ to 74.5¢; 12 to 14, 36.9¢ to 89¢; 24 to 26, 39.6¢ to $1.16; 36 to 38, 47.2¢ to $1.70.

Rod, Rolled: 1.5 to 4.5 in., 2S-F, 3S-F, 37.5¢ to 39.5¢; cold-finished, 0.375 to 3 in., 2S-F, 3S-F, 40.5¢ to 35¢.

Screw Machine Stock: Rounds, 11S-T3, ⅛ to 11/32 in., 53.5¢ to 42¢; ⅜ to 1½ in., 41.5¢ to 39¢; 1 9/16 to 3 in., 38.5¢ to 36¢; 17S-T4 lower by 1.5¢ per lb. Base 5000 lb.

Drawn Wire: Coiled, 0.051 to 0.374 in., 2S, 29.5¢ to 29¢; 52S, 43¢ to 35¢; 56S, 51¢ to 42¢; 17S-T4, 54¢ to 37.5¢; 61S-T4, 48.5¢ to 37¢; 75S-T6, 84¢ to 67.5¢.

Extruded Tubing, Rounds: 63S-T5, OD in in.: 1¼ to 2, 37¢ to 54¢; 2 to 4, 33.5¢ to 45.5¢; 4 to 6, 34¢ to 41.5¢; 6 to 9, 34.5¢ to 43.5¢.

Roofing Sheet, Flat: 0.019 in. x 28 in. per sheet, 72 in., $1.142; 96 in., $1.522; 120 in., $1.902; 144 in., $2.284. Gage 0.024 in. x 28 in., 72 in., $1.379; 96 in., $1.839; 120 in., $2.299; 144 in., $2.759. Coiled Sheet: 0.019 in. x 28 in., 28.2¢ per lb.; 0.024 in. x 28 in., 26.9¢ per lb.

Magnesium

(F.o.b. mill, freight allowed)

Sheet and Plate: FS1-O, ¼ in. 63¢; 3/16 in. 65¢; ⅛ in. 67¢; B & S Gage 10, 68¢; 12, 72¢; 14, 78¢; 16, 85¢; 18, 93¢; 20, $1.05; 22, $1.27; 24, $1.67. Specification grade higher. Base: 30,000 lb.

Extruded Round Rod: M, diam in., ¼ to 0.311 in., 74¢; ½ to ¾ in., 57.5¢; 1¼ to 1.749 in., 53¢; 2½ to 5 in., 48.5¢. Other alloys higher. Base: Up to ¾ in. diam, 10,000 lb; ¾ to 2 in., 20,000 lb; 2 in. and larger, 30,000 lb.

Extruded Solid Shapes, Rectangles: M. In weight per ft, for perimeters less than size indicated, 0.10 to 0.11 lb, 3.5 in., 62.3¢; 0.22 to 0.25 lb, 5.9 in., 59.3¢; 0.50 to 0.59 lb, 8.6 in., 56.7¢; 1.8 to 2.59 lb, 19.5 in., 53.8¢; 4 to 6 lb, 28 in., 49¢. Other alloys higher. Base, in weight per ft of shape: Up to ½ lb, 10,000 lb; ½ to 1.80 lb, 20,000 lb; 1.80 lb and heavier, 30,000 lb.

Extruded Round Tubing: M, wall thickness, outside diam, in., 0.049 to 0.057, ¼ in. to 5/16, $1.40; 5/16 to ⅜, $1.26; ½ to ⅝, 93¢; 1 to 2 in., 76¢; 0.165 to 0.219, ⅝ to ¾, 61¢; 1 to 2 in., 57¢; 3 to 4 in., 56¢. Other alloys higher. Base, OD in in.: Up to 1½ in., 10,000 lb; 1½ in. to 3 in., 20,000 lb; 3 in. and larger, 30,000 lb.

Titanium

(10,000 lb. base, f.o.b. mill)

Commercially pure and alloy grades: Sheet and strip, HR or CR, $15; Plate, HR, $12; Wire, rolled and/or drawn, $10; Bar, HR or forged, $6; Forgings, $6.

Nickel and Monel

(Base prices, f.o.b. mill)

	"A" Nickel	Monel
Sheets, cold-rolled	71½	57
Strip, cold-rolled	77½	60
Rods and bars	67½	55
Angles, hot-rolled	67½	55
Plates	69½	56
Seamless tubes	100½	90
Shot and blocks	....	50

Copper, Brass, Bronze

(Freight prepaid on 200 lb includes duty)

	Sheets	Rods	Extruded Shapes
Copper	41.03	....	40.63
Copper, h-r	....	36.88	....
Copper, drawn	....	38.18	....
Low brass	39.15	38.84	....
Yellow brass	38.28	37.97	....
Red brass	40.14	39.83	....
Naval brass	43.08	38.61	38.07
Leaded brass	....	32.63	36.70
Com'l bronze	41.13	40.82	....
Mang. bronze	45.96	40.65	41.41
Phos. bronze	60.20	60.45	....
Muntz metal	40.43	36.74	37.99
Ni silver, 10 pct	49.27	51.49	....
Arch. bronze	....	....	35.13

PRIMARY METALS

(Cents per lb, unless otherwise noted)

Aluminum ingot, 99+%, 10,000 lb, freight allowed	19.00
Aluminum pig	18.00
Antimony, American, Laredo, Tex.	42.00
Beryllium copper, 3.75-4.25% Be	$1.56
Beryllium aluminum 5% Be, Dollars per lb contained Be	$69.00
Bismuth, ton lots	$2.25
Cadmium, del'd	$2.55
Cobalt, 97-99% (per lb)	$2.10 to $2.17
Copper, electro, Conn. Valley	24.50
Copper, Lake, delivered	24.625
Gold, U. S. Treas., dollars per oz.	$35.00
Indium, 99.8%, dollars per troy oz.	$2.25
Iridium, dollars per troy oz.	$200
Lead, St. Louis	16.80
Lead, New York	17.00
Magnesium, 99.8+%, f.o.b. Freeport, Tex., 10,000 lb	24.50
Magnesium, sticks, 100 to 500 lb	42.00 to 44.00
Mercury, dollars per 76-lb flask f.o.b. New York	$225.00
Nickel, electro, f.o.b. New York	53.55
Nickel oxide sinter, f.o.b. Copper Cliff, Ont., contained nickel	46.75
Palladium, dollars per troy oz.	$24.00
Platinum, dollars per troy oz.	$90 to $93
Silver, New York, cents per oz.	90.16
Tin, New York	$1.83
Titanium, sponge	$5.00
Zinc, East St. Louis	17.50
Zinc, New York	18.22
Zirconium copper, 50 pct	$6.20

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5-5 ingot	
No. 115	29.00
No. 120	28.50
No. 123	28.00
80-10-10 ingot	
No. 305	35.00
No. 315	32.00
88-10-2 ingot	
No. 210	46.25
No. 215	43.25
No. 245	36.00
Yellow ingot	
No. 405	25.00
Manganese bronze	
No. 421	29.75

Aluminum Ingot

(Cents per lb, 30,000 lb lots)

95-5 aluminum-silicon alloys	
0.30 copper, max.	33.25-34.25
0.60 copper, max.	33.00-34.00
Piston alloys (No. 122 type)	30.50-31.00
No. 12 alum. (No. 2 grade)	30.00-30.50
108 alloy	30.25-30.75
195 alloy	31.25-31.75
13 alloy	33.50-34.00
ASX-679	30.50-31.00

Steel deoxidizing aluminum, notch-bar granulated or shot

Grade 1—95-97½%	32.00-32.50
Grade 2—92-95%	30.25-30.75
Grade 3—90-92%	29.25-29.75
Grade 4—85-90%	28.75-29.25

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, freight allowed, 500 lb lots)

Copper	
Cast, oval, 15 in. or longer	39¼
Electrodeposited	33⅝
Rolled, oval, straight, delivered	38⅝
Forged ball anodes	43
Brass, 80-20	
Cast, oval, 15 in. or longer	34¾
Zinc, oval	26½
Ball anodes	25½
Nickel 99 pct plus	
Cast	70.50
Rolled, depolarized	71.50
Cadmium	$2.80
Silver 999 fine, rolled, 100 oz lots, per troy oz, f.o.b. Bridgeport, Conn.	79½

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum	52.15
Copper sulfate, 99.5 crystals, bbl.	12.85
Nickel salts, single or double, 4-100 lb bags, frt allowed	20½
Nickel chloride, 375 lb drum	27½
Silver cyanide, 100 oz lots, per oz.	67¼
Sodium cyanide, 96 pct domestic 200 lb drums	19.25
Zinc cyanide, 100 lb drums	45.85

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add ½¢ per lb for shipments of 20,000 to 40,000 lb; add 1¢ for more than 40,000 lb)

	Heavy	Turnings
Copper	23	22¼
Yellow brass	20½	18¾
Red brass	21½	20¾
Comm. bronze	21¾	21
Mang. bronze	19½	18¾
Brass rod ends	19¾	....

Custom Smelters' Scrap

(Cents per pound, carload lots, delivered to refinery)

No. 1 copper wire	21.50
No. 2 copper wire	20.00
Light copper	19.00
Refinery brass	19.50*
Radiators	15.00

*Dry copper content.

Ingot Makers' Scrap

(Cents per pound, carload lots, delivered to producer)

No. 1 copper wire	23.00
No. 2 copper wire	22.00
Light copper	21.00
No. 1 composition	22.00
No. 1 comp. turnings	21.50
Rolled brass	18.50
Brass pipe	20.50
Radiators	17.50
Heavy yellow brass	17.00
Aluminum	
Mixed old cast	18½—19
Mixed new clips	20¼
Mixed turnings, dry	18⅛
Pots and pans	18½—19
Low copper	21½—22

Dealers' Scrap

(Dealers' buying prices, f.o.b. New York in cents per pound)

Copper and Brass	
No. 1 heavy copper and wire	19½—20
No. 2 heavy copper and wire	18 —18½
Light copper	17 —17¼
New type shell cuttings	17 —17¼
Auto radiators (unsweated)	14½—15
No. 1 composition	17 —17⅛
No. 1 composition turnings	16½—17
Clean red car boxes	15½—16
Cocks and faucets	15½—16
Mixed heavy yellow brass	13 —13½
Old rolled brass	14 —14¼
Brass pipe	17 —17½
New soft brass clippings	17½—18
Brass rod ends	16½—17
No. 1 brass rod turnings	16 —16½
Aluminum	
Alum. pistons and struts	12 —13
Aluminum crankcases	15 —16
2S aluminum clippings	18½—19½
Old sheet and utensils	15 —16
Borings and turnings	12½—13
Misc. cast aluminum	15 —16
Dural clips (24S)	15 —16
Zinc	
New zinc clippings	14½—15
Old zinc	11 —11¼
Zinc routings	8½— 9
Old die cast scrap	8 — 8¼
Nickel and Monel	
Pure nickel clippings	60 —65
Clean nickel turnings	57 —60
Nickel anodes	60 —65
Nickel rod ends	60 —65
New Monel Clippings	22 —25
Clean Monel turnings	18 —20
Old sheet Monel	20 —22
Inconel clippings	26 —28
Nickel silver clippings, mixed	13 —14
Nickel silver turnings, mixed	12 —13
Lead	
Soft scrap, lead	15 —15¼
Battery plates (dry)	8¾— 9
Magnesium	
Segregated solids	9 —10
Castings	5½— 6½
Miscellaneous	
Block tin	90 —100
No. 1 pewter	63 —65
No. 1 auto babbitt	58 —60
Mixed common babbitt	12¼—12½
Solder joints	20 —21
Siphon tops	58 —60
Small foundry type	18¼—18½
Monotype	16¾—17
Lino. and stereotype	16½—16¾
Electrotype	14¾—15
Hand picked type shells	11½—11¾
Lino. and stereo. dross	3 — 3¼
Electro. dross	6½— 6¾

SCRAP *iron and steel*

markets
prices
trends

Markets dull on eve of price rollbacks . . .
NPA issues scrap inventory control order
. . . Cleveland, Cincinnati markets lively.

It was the eve of price rollbacks on scrap as this issue hit the presses and everything was mostly quiet throughout the markets—except blood pressure of men in the trade. They had played guessing games with Washington before and had discovered that the capitol was unpredictable. But this time it looked like "it."

Before the rollback broke, it was impossible to divine the backward trend. Astounding was the lack of rumors on the scope of the rollback. It seemed that everyone in Washington was this time keeping mum.

With the exception of Cleveland and Cincinnati, which played it wild and wooly on trading till what seemed the final minute, the markets reported low and spotty activity. Most were content to see what the rollbacks would be.

NPA has amended order M-20 so that it can order increases or decreases in consumer steel scrap inventories and allocate scrap and specifically direct the manner and quantities of delivery. The order doesn't change the 60-day limit on dealer and broker inventories nor mills' practical working minimum.

The guessing contest held by THE IRON AGE at the scrap convention in New York was won by Herman Caplan, of M. W. Singer & Co., Pittsburgh, with a shrewd guess of 1680 pieces of scrap in the fish bowl. Actual count: 1653.

PITTSBURGH—As a protective measure to halt the flow of scrap to other districts, the largest consumer here has agreed to pay a competitive price pending imposition of controls. This has had the effect of tentatively advancing prices on melting grades $5 per ton, at the least. Turnings were up similarly on the basis of purchases by another mill. Under this arrangement, the consumer will take in scrap without immediate billing, with the price dependent on the nature of the control order.

If the order is effective after Jan. 24, when the arrangement was made, the competitive price as of that time will be paid on scrap already shipped. If the order is retroactive to an earlier date, however, the mill will pay only the control price. Chances are that the order will not be retroactive, although it is expected to specify that uncompleted orders not be filled if the price is higher than the control figure.

CHICAGO—Prior to the announcement of a price freeze last week some dealers were being offered as high as $47 per gross ton for a few carloads of No. 1 heavy melting steel for shipment to the East. Local mills, however, were still getting scrap at formula prices. Some dealers were reluctant to ship to the East because of fear of rejections. It was also reported that some foundries were offering $48 per gross ton for immediate shipment of small tonnages of No. 1 steel to get scrap in under the deadline. Otherwise there was not much activity as the trade was waiting the arrival of rollbacks.

PHILADELPHIA—There were few price changes prior to the government's price freeze order, although the market was suffering from general confusion. Some of the local consumers stayed out of the market waiting for it but quick shipments of insignificant tonnages could demand their own prices from others. The $5 increase in Pittsburgh caused some steel scrap to drift out of this district.

NEW YORK—On the eve of price controls the scrap market here was confused. Brokers were waiting for the price rollback, but last week the melting grades got a shot in the arm and advanced $1 on No. 1 to a ceiling of $45.

DETROIT—The Detroit scrap market is standing virtually still in the face of reports that price rollbacks are imminent. While most scrap sources anticipate a rollback in prices will be imposed simultaneously with controls, there is a wide variation of opinion as to the price level that will be set by Washington. Meanwhile, the present situation is badly confused. Even further confusion is anticipated when controls are finally announced. In the meantime, demand for mill grades is holding although interest in cast grades appears to be noticeably softer than it was a few weeks ago.

CLEVELAND—Scrap is moving freely and in large tonnages here and in the Valley on what is thought to be the eve of price controls. Deals are numerous and the price of No. 1, for spot tonnages on the ground, is practically anybody's guess. Dealers and brokers are moving every pound they can. The market for blast furnace grades is confused, but major consumers were able to buy tonnage this week at $40, a substantial drop from last week's level. Foundry grades are strong but not moving.

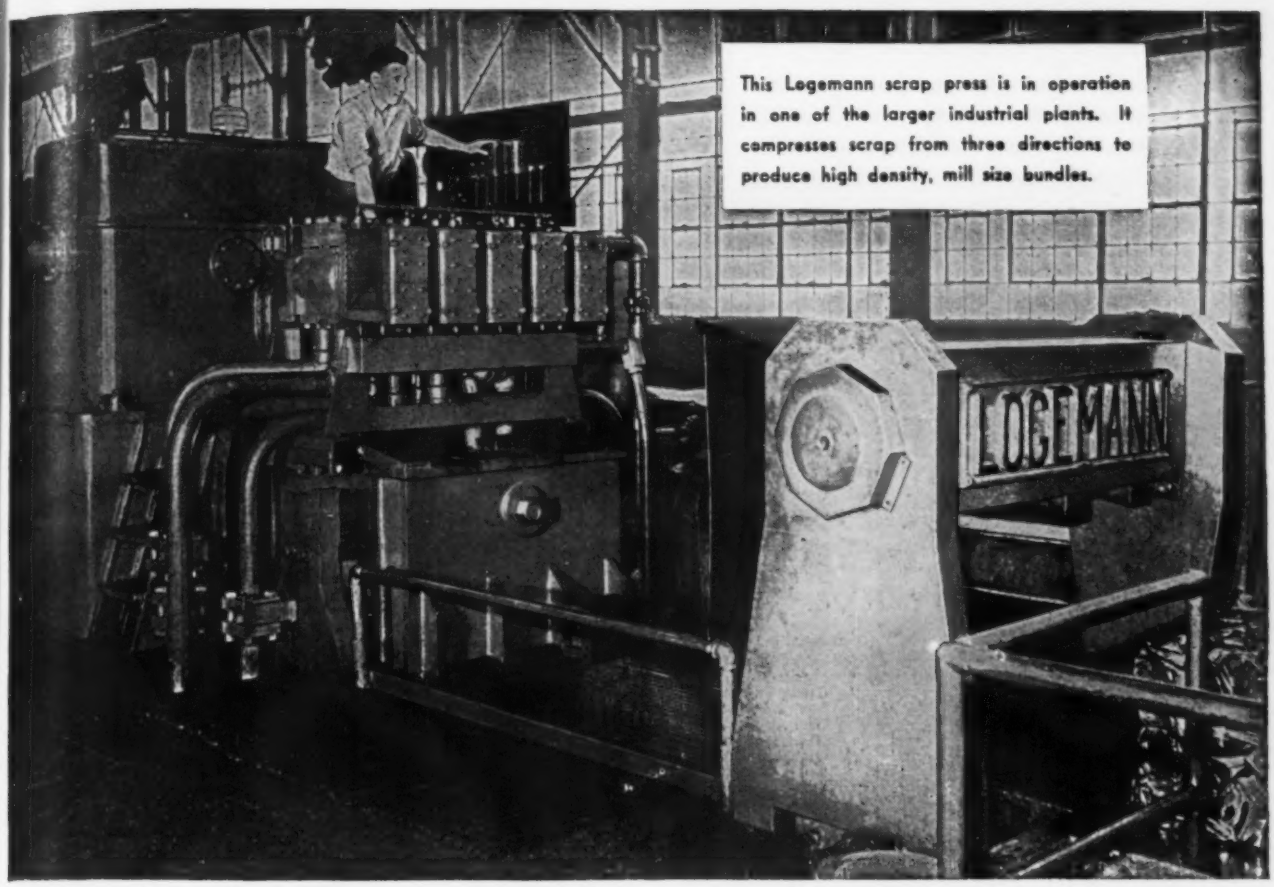
ST. LOUIS—Pending issuance of expected price controls buying of scrap iron in the St. Louis market has been confined to small lots needed by consumers to tide them over an emergency. In such cases prices paid have been higher than the formula now in effect. Receipts have been cut down as a result of bad weather conditions which also have halted processing operations. Prices are unchanged.

BIRMINGHAM—The scrap market is quiet here, with most buyers apparently waiting for the government to decide if there will be a price rollback. There have been no price changes. A prominent consumer, which last week announced it was out of the market, came back in this week when it was learned dealers were buying in Georgia and selling to Northern mills.

CINCINNATI—A strong but confused scrap market here was ready to greet controls with fixed emotions. Brokers raised their buying prices for No. 1 heavy melting steel and blast furnace grades over the week end to meet competition from other districts. Anybody with an order is shipping everything he can get his hands on. Foundry grades are strong but inactive. Demand is there, but foundries waited for lower control prices.

BOSTON—Prices inched further and further from the formula price of 8 weeks ago, $35.67 for No. 1 heavy melting, as scrap moved freely in a lively market. Prices on most items were up, with No. 1 heavy melting and No. 1 bundles at $42 to $43.

BUFFALO—As the trade here awaited rollbacks, dealers rushed scrap to a top consumer at recently-set higher prices. It was generally conceded that the spurt in prices would be a temporary situation. While the price rise brought out more scrap, supply is uncertain.



This Logemann scrap press is in operation in one of the larger industrial plants. It compresses scrap from three directions to produce high density, mill size bundles.

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Iron and Steel

SCRAP PRICES

Going prices as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Pittsburgh

No. 1 hvy. melting	$50.75 to $51.50
No. 2 hvy. melting	48.75 to 49.50
No. 1 bundles	50.75 to 51.50
No. 2 bundles	47.75 to 48.50
Machine shop turn.	43.25 to 44.00
Mixed bor. and ms. turns.	43.25 to 44.00
Shoveling turnings	44.75 to 45.50
Cast iron borings	44.75 to 45.50
Low phos. plate	56.00 to 56.50
Heavy turnings	51.50 to 52.00
No. 1 RR. hvy. melting	50.75 to 51.50
Scrap rails, random lgth.	64.50 to 65.00
Rails 2 ft and under	68.00 to 69.00
RR. steel wheels	63.00 to 64.00
RR. spring steel	63.00 to 64.00
RR. couplers and knuckles	63.00 to 64.00
No. 1 machinery cast	67.50 to 68.00
Mixed yard cast.	57.50 to 58.00
Heavy breakable cast	53.00 to 53.50
Malleable	71.00 to 72.00

Chicago

No. 1 hvy. melting	$44.25 to $45.00
No. 2 hvy. melting	42.00 to 43.00
No. 1 factory bundles	44.00 to 45.00
No. 1 dealers' bundles	44.00 to 45.00
No. 2 dealers' bundles	41.00 to 42.00
Machine shop turn.	36.00 to 37.00
Mixed bor. and turn.	36.00 to 37.00
Shoveling turnings	37.00 to 38.00
Cast iron borings	37.00 to 38.00
Low phos. forge crops	54.00 to 55.00
Low phos. plate	52.00 to 53.00
No. 1 RR. hvy. melting	47.00 to 48.00
Scrap rails, random lgth.	62.00 to 63.00
Rerolling rails	65.50 to 66.50
Rails 2 ft and under	67.00 to 69.00
Locomotive tires, cut	58.00 to 59.00
Cut bolsters & side frames	54.00 to 55.00
Angles and splice bars	63.00 to 64.00
RR. steel car axles	95.00 to 100.00
RR. couplers and knuckles	58.00 to 59.00
No. 1 machinery cast.	62.00 to 64.00
No. 1 agricul. cast.	58.00 to 60.00
Heavy breakable cast.	53.00 to 55.00
RR. grate bars	48.00 to 49.00
Cast iron brake shoes	52.00 to 53.00
Cast iron car wheels	58.00 to 59.00
Malleable	78.00 to 82.00

Philadelphia

No. 1 hvy. melting	$47.00 to $48.00
No. 2 hvy. melting	44.00 to 45.00
No. 1 bundles	47.00 to 48.00
No. 2 bundles	42.00 to 43.00
Machine shop turn.	38.00 to 39.00
Shoveling turnings	40.00 to 41.00
Low phos. punchings, plate	52.00 to 53.00
Low phos. 5 ft and under	52.00 to 53.00
Low phos. bundles	50.00 to 51.00
Hvy. axle forge turn.	46.00 to 47.00
Clean cast chem. borings	44.00 to 45.00
RR. steel wheels	56.00 to 57.00
RR. spring steel	56.00 to 57.00
Rails 18 in. and under	66.00 to 67.00
No. 1 machinery cast.	62.00 to 63.00
Mixed yard cast.	53.00 to 55.00
Heavy breakable cast.	53.00 to 54.00
Cast iron carwheels	67.00 to 68.00
Malleable	70.00 to 72.00

Cleveland

No. 1 hvy. melting	$51.00 to $52.00
No. 2 hvy. melting	49.00 to 50.00
No. 1 busheling	51.00 to 52.00
No. 1 bundles	51.00 to 52.00
No. 2 bundles	48.00 to 49.00
Machine shop turn.	37.00 to 38.00
Mixed bor. and turn.	39.00 to 40.00
Shoveling turnings	39.00 to 40.00
Cast iron borings	39.00 to 40.00
Low phos. 2 ft and under	53.50 to 54.50
Steel axle turn.	50.00 to 51.00
Drop forge flashings	51.00 to 52.00
No. 1 RR. hvy. melting	51.50 to 52.00
Rails 3 ft and under	70.00 to 71.00
Rails 18 in. and under	72.00 to 73.00
No. 1 machinery cast.	69.00 to 70.00
RR. cast.	71.00 to 72.00
RR. grate bars	50.00 to 51.00
Stove plate	55.00 to 56.00
Malleable	76.00 to 77.00

Youngstown

No. 1 hvy. melting	$51.50 to $52.50
No. 2 hvy. melting	49.50 to 50.50
No. 1 bundles	51.50 to 52.50
No. 2 bundles	$48.50 to $49.50
Machine shop turn	42.50 to 43.50
Shoveling turnings	44.50 to 45.50
Cast iron borings	44.50 to 45.50
Low phos. plate	54.00 to 55.00

Buffalo

No. 1 hvy. melting	$51.25 to $52.00
No. 2 hvy. melting	49.25 to 50.00
No. 1 bushelings	49.25 to 50.00
No. 1 bundles	50.25 to 51.00
No. 2 bundles	47.25 to 48.00
Machine shop turn.	43.25 to 44.00
Mixed bor. and turn.	43.25 to 44.00
Shoveling turnings	45.25 to 46.00
Cast iron borings	43.25 to 44.00
Low phos. plate	51.25 to 52.00
Scrap rails, random lgth.	55.00 to 56.00
Rails 2 ft and under	60.00 to 61.00
RR. steel wheels	60.00 to 61.00
RR. spring steel	60.00 to 61.00
RR. couplers and knuckles	60.00 to 61.00
No. 1 machinery cast.	59.00 to 60.00
No. 1 cupola cast.	54.00 to 55.00
Small indus. malleable	60.00 to 61.00

Birmingham

No. 1 hvy. melting	$42.50 to $43.50
No. 2 hvy. melting	40.50 to 41.50
No 2 bundles	39.50 to 40.50
No. 1 busheling	40.50 to 41.50
Machine shop turn.	34.00 to 35.00
Shoveling turnings	32.00 to 33.00
Cast iron borings	33.00 to 34.00
Bar crops and plate	47.00 to 48.00
Structural and plate	46.00 to 47.00
No. 1 RR. hvy. melting	43.00 to 44.00
Scrap rails, random lgth.	58.00 to 59.00
Rerolling rails	61.00 to 62.00
Rails 2 ft and under	66.00 to 67.00
Angles & splice bars	59.00 to 60.00
Std. steel axles	61.00 to 62.00
No. 1 cupola cast.	54.00 to 55.00
Stove plate	49.00 to 50.00
Cast iron carwheels	46.00 to 47.00

St. Louis

No. 1 hvy. melting	$43.75 to $44.50
No. 2 hvy. melting	41.75 to 42.50
No. 2 bundled sheets	40.75 to 41.50
Machine shop turn.	33.75 to 34.75
Shoveling turnings	36.50 to 37.50
Rails, random lengths	49.00 to 50.00
Rails 3 ft and under	62.00 to 63.00
Locomotive tires, uncut	50.00 to 51.00
Angles and spice bars	59.00 to 60.00
Std. steel car axles	90.00 to 95.00
RR. spring steel	53.00 to 54.00
No. 1 machinery cast.	55.00 to 56.00
Hvy. breakable cast.	48.00 to 49.00
Cast iron brake shoes	53.00 to 54.00
Stove plate	45.00 to 47.00
Cast iron car wheels	60.00 to 62.00
Malleable	55.00 to 57.00

New York

Brokers' Buying prices per gross ton, on cars:

No. 1 hvy. melting	$44.00 to $45.00
No. 2 hvy. melting	41.00 to 42.00
No. 2 bundles	40.00 to 41.00
Machine shop turn.	32.00 to 34.00
Mixed bor. and turn.	32.00 to 34.00
Shoveling turnings	34.00 to 36.00
Clean cast chem. bor.	40.00 to 41.00
No. 1 machinery cast.	52.00 to 53.00
Mixed yard cast.	47.00 to 48.00
Charging box cast.	47.00 to 48.00
Heavy breakable cast.	47.00 to 48.00
Unstrp. motor blocks	42.00 to 43.00

Boston

Brokers' Buying prices per gross ton, on cars:

No. 1 hvy. melting	$42.00 to $43.00
No. 2 hvy. melting	37.50 to 38.50
No. 1 bundles	42.00 to 43.00
No. 2 bundiles	$40.00 to $41.00
Machine shop turn	30.00 to 31.00
Mixed bor. and turn.	30.00 to 31.00
Shoveling turnings	32.00 to 33.00
No. 1 busheling	41.00 to 42.00
Clean cast chem. borings	35.00 to 36.00
No. 1 machinery cast.	48.00 to 49.00
Mixed cupola cast.	44.00 to 45.00
Heavy breakable cast.	42.00 to 43.00
Stove plate	42.00 to 43.00

Detroit

Brokers' Buying prices per gross ton, on cars:

No. 1 hvy. melting	$40.25
No. 2 hvy. melting	38.25
No. 1 bundles, openhearth	40.25
No. 1 bundles, electric furnace	42.75
New busheling	40.25
Flashings	40.25
Machine shop turn.	32.25
Mixed bor. and turn.	32.25
Shoveling turnings	34.25
Cast iron borings	34.25
Low phos. plate	42.75
No. 1 cupola cast.	$54.00 to 56.00
Heavy breakable cast.	45.00 to 47.00
Stove plate	44.00 to 46.00
Automotive cast.	58.00 to 60.00

Cincinnati

Per gross ton, f.o.b. cars:

No. 1 hvy. melting	$45.50
No. 2 hvy. melting	43.25
No. 1 bundles	45.50
No. 2 bundles, black	42.25
No. 2 bundles, mixed	41.25
Machine shop turn.	35.00
Mixed bor. and turn.	35.00
Shoveling turnings	36.00
Cast iron borings	36.00
Low phos.-steel	46.75
Low phos. 18 in. under	62.00
Rails, random lengths	$62.00 to 63.00
Rails, 18 in. and under	72.00 to 73.00
No. 1 cupola cast.	45.00 to 47.00
Hvy. breakable cast.	59.00 to 60.00
Drop broken cast.	71.00 to 72.00

San Francisco

No. 1 hvy. melting	$30.00 to $34.00
No. 2 hvy. melting	28.00 to 32.00
No. 1 bundles	30.00 to 34.00
No. 2 bundles	28.00 to 32.00
No. 3 bundles	25.00
Machine shop turn.	16.00 to 18.00
Elec. fur. 1 ft and under	40.00 to 42.50
No. 1 RR. hvy. melting	30.00 to 46.00
Scrap rails random lgth.	30.00 to 46.00
No. 1 cupola cast.	45.00 to 47.00

Los Angeles

No. 1 hvy. melting	$30.00 to $34.00
No. 2 hvy. melting	28.00 to 32.00
No. 1 bundles	30.00 to 34.00
No. 2 bundles	28.00 to 32.00
No. 3 bundles	25.00
Mach. shop turn.	16.00 to 18.00
Elec. fur. 1 ft and under	40.00 to 42.50
No. 1 RR. hvy. melting	30.00 to 46.00
Scrap rails random lgth.	30.00 to 46.00
No. 1 cupola cast.	52.00 to 54.00

Seattle

No. 1 hvy. melting	$28.00
No. 2 hvy. melting	28.00
No. 1 bundles	22.00
No. 2 bundles	22.00
No. 3 bundles	18.00
Elec. fur. 1 ft and under	$40.00 to 45.00
RR. hvy. melting	29.00
No. 1 cupola cast.	45.00

Hamilton, Ont.

No. 1 hvy. melting	$30.00
No. 1 bundles	30.00
No. 2 bundles	29.50
Mechanical bundles	28.00
Mixed steel scrap	26.00
Mixed bor. and turn.	23.00
Rails, remelting	30.00
Rails, rerolling	33.00
Bushelings	24.50
Bush., new fact. prep'd	29.00
Bush., new fact. unprep'd	23.00
Short steel turnings	23.00
Cast scrap	45.00

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LEADERS IN IRON AND STEEL SCRAP SINCE 1889

Berman

Comparison of Prices

Steel prices in this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Flat-Rolled Steel: (cents per pound)	Jan. 30, 1951	Jan. 23, 1951	Jan. 2, 1951	Jan. 31 1950
Hot-rolled sheets	3.60	3.60	3.60	3.35
Cold-rolled sheets	4.35	4.35	4.35	4.10
Galvanized sheets (10 ga)	4.80	4.80	4.80	4.40
Hot-rolled strip	3.50	3.50	3.50	3.25
Cold-rolled strip	4.75	4.75	4.75	4.21
Plate	3.70	3.70	3.70	3.50
Plates wrought iron	7.85	7.85	7.85	7.85
Stains C-R-strip (No. 302)	36.50	36.50	36.50	33.00
Tin and Terneplate: (dollars per base box)				
Tinplate (1.50 lb) cokes.	$7.50	$7.50	$7.50	$7.50
Tinplate, electro (0.50 lb)	6.60	6.60	6.60	6.60
Special coated mfg. ternes	6.35	6.35	6.35	6.50
Bars and Shapes: (cents per pound)				
Merchant bars	3.70	3.70	3.70	3.45
Cold finished bars	4.55	4.55	4.55	*4.145
Alloy bars	4.30	4.30	4.30	3.95
Structural shapes	3.65	3.65	3.65	3.40
Stainless bars (No. 302).	31.25	31.25	31.25	28.50
Wrought iron bars	9.50	9.50	9.50	9.50
Wire: (cents per pound)				
Bright wire	4.85	4.85	4.85	4.50
Rails: (dollars per 100 lb)				
Heavy rails	$3.60	$3.60	$3.60	$3.40
Light rails	4.00	4.00	4.00	3.75
Semifinished Steel: (dollars per net ton)				
Rerolling billets	$56.00	$56.00	$56.00	$54.00
Slabs, rerolling	56.00	56.00	56.00	54.00
Forging billets	66.00	66.00	66.00	63.00
Alloy blooms billets, slabs	70.00	70.00	70.00	66.00
Wire Rod and Skelp: (cents per pound)				
Wire rods	4.10	4.10	4.10	3.85
Skelp	3.35	3.35	3.35	3.15

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*

Pig Iron: (per gross ton)	Jan. 30, 1951	Jan. 23, 1951	Jan. 2, 1951	Jan. 31 1950
No. 2 foundry, del'd Phila.	$57.77	$57.77	$57.77	$50.42
No. 2, Valley furnace	52.50	52.50	52.50	46.50
No. 2, Southern Cin'ti	55.58	55.58	55.58	47.08
No. 2, Birmingham	48.88	48.88	48.88	40.38
No. 2, foundry, Chicago†	52.50	52.50	52.50	46.50
Basic del'd Philadelphia	56.92	56.92	56.92	49.92
Basic, Valley furnace	52.00	52.00	52.00	46.00
Malleable, Chicago†	52.50	52.50	52.50	46.50
Malleable, Valley	52.50	52.50	52.50	46.50
Charcoal, Chicago	70.56	70.56	70.56	68.56
Ferromanganese‡	186.25	186.25	181.20	173.40

†The switching charge for delivery to foundries in the Chicago district is $1 per ton.
‡Average of U. S. prices quoted on Ferroalloy page.

Scrap: (per gross ton)				
Heavy melt'g steel, P'gh.	$51.13	$46.13	$46.13	$30.75
Heavy melt'g steel, Phila.	47.50	47.50	44.50	23.00
Heavy melt'g steel, Ch'go	44.63	44.63	44.63	27.50
No. 1 hy. com. sh't, Det.	40.25	40.25	40.25	23.50
Low phos. Young'n	54.50	54.50	48.63	31.75
No. 1 cast, Pittsburgh	67.75	67.75	67.75	37.50
No. 1 cast, Philadelphia	62.50	62.50	62.50	37.00
No. 1 cast, Chicago	63.00	63.00	63.00	38.50
Coke: Connellsville: (per net ton at oven)				
Furnace coke, prompt	$14.25	$14.25	$14.25	$14.00
Foundry coke, prompt	17.25	17.25	17.25	15.75
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electro, Conn.	24.50	24.50	24.50	18.50
Copper, Lake, Conn.	24.625	24.625	24.625	18.625
Tin, Straits, New York	$1.83†	$1.78*	$1.50	74.50
Zinc, East St. Louis	17.50	17.50	17.50	9.75
Lead, St. Louis	16.80	16.80	16.80	11.80
Aluminum, virgin	19.00	19.00	19.00	17.00
Nickel, electrolytic	53.55	53.55	53.55	42.97
Magnesium, ingot	24.50	24.50	24.50	20.50
Antimony, Laredo, Tex.	42.00	42.00	32.00	28.75

†Tentative. *Revised.

Composite Prices

Starting with the issue of May 12, 1949, the weighted finished steel composite was revised for the years 1941 to date. The weights used are based on the average product shipments for the 7 years 1937 to 1940 inclusive and 1946 to 1948 inclusive. The use of quarterly figures has been eliminated because it was too sensitive. (See p. 130 of May 12, 1949, issue.)

	Finished Steel Base Price	Pig Iron	Scrap Steel
Jan. 30, 1951	4.131¢ per lb.	$52.69 per gross ton	$47.75 per gross ton
One week ago	4.131¢ per lb.	52.69 per gross ton	46.08 per gross ton
One month ago	4.131¢ per lb.	52.69 per gross ton	45.09 per gross ton
One year ago	3.837¢ per lb.	46.05 per gross ton	27.08 per gross ton

	Finished Steel Base Price High	Finished Steel Base Price Low	Pig Iron High	Pig Iron Low	Scrap Steel High	Scrap Steel Low
1951	4.131¢ Jan. 2	4.131¢ Jan. 2	$52.69 Jan. 2	$52.69 Jan. 2	$47.75 Jan. 30	$45.09 Jan. 2
1950	4.131¢ Dec. 1	3.837¢ Jan. 3	52.69 Dec. 12	45.88 Jan. 3	45.13 Dec. 19	26.25 Jan. 3
1949	3.837¢ Dec. 27	3.3705¢ May 3	46.87 Jan. 18	45.88 Sept. 6	43.00 Jan. 4	19.33 June 28
1948	3.721¢ July 27	3.193¢ Jan. 1	46.91 Oct. 12	39.58 Jan. 6	43.16 July 27	39.75 Mar. 9
1947	3.193¢ July 29	2.848¢ Jan. 1	37.98 Dec. 30	30.14 Jan. 7	42.58 Oct. 28	29.50 May 20
1946	2.848¢ Dec. 31	2.464¢ Jan. 1	30.14 Dec. 10	25.37 Jan. 1	31.17 Dec. 24	19.17 Jan. 1
1945	2.464¢ May 29	2.396¢ Jan. 1	25.37 Oct. 23	23.61 Jan. 2	19.17 Jan. 2	18.92 May 22
1944	2.396¢	2.396¢	$23.61	$23.61	19.17 Jan. 11	15.76 Oct. 24
1943	2.396¢	2.396¢	23.61	23.61	$19.17	$19.17
1942	2.396¢	2.396¢	23.61	23.61	19.17	19.17
1941	2.396¢	2.396¢	$23.61 Mar. 20	$23.45 Jan. 2	$22.00 Jan. 7	$19.17 Apr. 10
1940	2.30467¢ Jan. 2	2.24107¢ Apr. 16	23.45 Dec. 23	22.61 Jan. 2	21.83 Dec. 30	16.04 Apr. 9
1939	2.35367¢ Jan. 3	2.26689¢ May 16	22.61 Sept. 19	20.61 Sept. 12	22.50 Oct. 3	14.08 May 16
1938	2.58414¢ Jan. 4	2.27207¢ Oct. 18	23.25 June 21	19.61 July 6	15.00 Nov. 22	11.00 June 7
1937	2.58414¢ Mar. 9	2.32263¢ Jan. 4	32.25 Mar. 9	20.25 Feb. 16	21.92 Mar. 30	12.67 June 9
1936	2.32263¢ Dec. 28	2.05200¢ Mar. 10	19.74 Nov. 24	18.73 Aug. 11	17.75 Dec. 21	12.67 June 8
1932	1.89196¢ July 5	1.83910¢ Mar. 1	14.81 Jan. 5	13.56 Dec. 6	8.50 Jan. 12	6.43 July 5
1929	2.31773¢ May 28	2.26498¢ Oct. 29	18.71 May 14	18.21 Dec. 17	17.58 Jan. 29	14.08 Dec. 8

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strips, representing major portion of finished steel shipment. Index recapitulated in Aug. 28, 1941, issue and in May 12, 1949.

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

PRODUCED TO PRECISION TOLERANCES

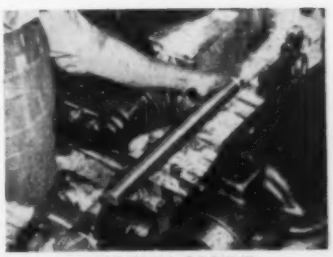
B&L COLD FINISHED GROUND AND POLISHED SHAFTING

THE nation's call for vastly increased production means a greater demand for B&L Ground and Polished Shafting to help build top efficiency and durability into machinery and equipment.

Its use is justified by smoother running machines, longer-lived bearings, as well as reduced friction, vibration and wear.

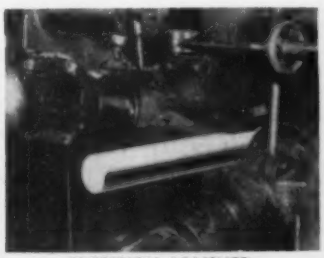
For manufacturers, this precision-made product means lower costs through easier assemblies, less machining, faster work in alignment and fitting of parts.

It is available in grades and finishes for your every application: Cold Drawn, Ground and Polished; or Turned, Ground and Polished . . . standard or special accuracy . . . as-rolled and cold finished, Strain-Tempered, annealed or specially heat treated.

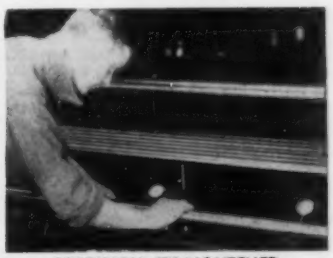


PRECISION GROUND

PRECISION CHECKED



PRECISION POLISHED



PRECISION STRAIGHTENED

SINCE 1891

BLISS & LAUGHLIN, INC.

GENERAL OFFICES: HARVEY, ILLINOIS

PLANTS: HARVEY, ILL. • BUFFALO, N. Y. • MANSFIELD, MASS.

SALES OFFICES IN ALL PRINCIPAL CITIES

IRON AGE

STEEL PRICES

Smaller numbers in price boxes indicate producing companies. For main office locations, see key on facing page.
Base prices at producing points apply only to sizes and grades produced in these areas. Prices are in cents per lb unless otherwise noted. Extras apply.

	Pittsburgh	Chicago	Gary	Cleveland	Canton Massillon	Middletown	Youngstown	Bethlehem	Buffalo	Conshohocken	Johnstown	Sparrows Point	Granite City	Detroit
INGOTS Carbon forging, net ton	$52.00[1]													
Alloy, net ton	$54.00[1-17]													$54.00[31]
BILLETS, BLOOMS, SLABS Carbon, rerolling, net ton	$56.00[1-5]	$56.00[1]	$56.00[1]						$56.00[3]		$56.00[3]			
Carbon forging billets, net ton	$66.00[1-5]	$66.00[1-4]	$66.00[1]	$66.00[4]	$66.00[4]				$66.00[3-4]	$73.00[26]	$66.00[3]			$69.00[31]
Alloy, net ton	$70.00[1-17]	$70.00[1-4]	$70.00[1]		$70.00[4]			$70.00[3]	$70.00[3-4]	$77.00[26]	$70.00[3]			$73.00[31]
PIPE SKELP	3.35[1] 3.45[5]						3.35[1-4]							
WIRE RODS	4.10[2] 4.30[18]	4.10[2-4-33]	4.10[6]	4.10[2]			4.10[6]				4.10[3]	4.20[3]		
SHEETS Hot-rolled (18 ga. & hvr.)	3.60[1-5-9-15] 3.75[28]	3.60[8-23]	3.60[1-6-8]	3.60[4]		3.60[7]	3.60[1-4-6] 4.00[13]		3.60[3]	4.00[26]		3.60[3]		3.80[12] 4.40[47]
Cold-rolled	4.35[1-5-9-15] 5.35[63]		4.35[1-6-8]	4.35[4]		4.35[7]	4.35[1-6]		4.35[3]			4.35[3]		4.55[12]
Galvanized (10 gage)	4.80[1-9-15]		4.80[1-8]		4.80[4]	4.80[7]	6.00[64]					4.80[3]		
Enameling (12 gage)	4.65[1]		4.65[1-5]			4.65[7]								
Long terne (10 gage)	5.20[9-15]						6.00[64]							
Hi str. low alloy, h.r.	5.40[1-5] 5.75[9]	5.40[1]	5.40[1-8] 5.90[6]	5.40[4]			5.40[1-4-13]		5.40[3]	5.65[26]		5.40[3]		
Hi str. low alloy, c.r.	6.55[1-5] 6.90[9]		6.55[1-8] 7.05[6]	6.55[4]			6.55[4]		6.55[2]			6.55[2]		
Hi str. low alloy, galv.	7.20[1]													
STRIP Hot-rolled	3.60[9], 4.00[41-58], 3.75[28] 3.50[5]	3.50[66]	3.50[1-6-8]			3.50[7]	3.50[1-4-6] 4.00[13]		3.50[3-4]	3.90[26]		3.50[3]		4.40[47]
Cold-rolled	4.65[5-9] 5.00[28] 5.35[63-58]	4.90[8-66]	4.90[8]	4.65[2]		4.65[7]	4.65[4-6] 5.35[13-40]		4.65[3]			4.65[3]		5.45[47] 5.60[68] 5.80[81]
Hi str. low alloy, h.r.	5.75[9]		5.50[1] 5.30[8], 5.80[6]				4.95[4], 5.50[1] 5.40[13]			5.55[26]				
Hi str. low alloy, c.r.	7.20[9]			6.70[5]			6.20[4], 6.55[13]							
TINPLATE† Coke, 1.50-lb base box 1.25 lb, deduct 25¢	8.70[1-9-15]		8.70[1-6]				8.70[4]					8.80[3]		
Electrolytic 0.25, 0.50, 0.75 lb box	Deduct $1.55, $1.30 and 90¢ respectively from 1.50-lb coke base box price													
BLACKPLATE, 29 gage Hollowware enameling	5.85[1] 6.15[15]		5.85[1]				5.30[4]							
BARS Carbon steel	3.70[1-5] 3.85[9]	3.70[1-4-23]	3.70[1-4-6-8]	3.70[4]	3.70[4]		3.70[1-4-6]		3.70[3-4]		3.70[3]			3.85[21]
Reinforcing‡	3.70[1-5]	3.70[4]	3.70[1-6-8]	3.70[4]			3.70[1-4]		3.70[3-4]		3.70[3]	3.70[3]		
Cold-finished	4.55[2-4-5-52-71]	4.55[2-69-70-23-73]	4.55[74-73]	4.55[2]	4.55[4-82]									4.70[84]
Alloy, hot-rolled	4.30[1-17]	4.30[1-4-23]	4.30[1-6-8]		4.30[4]		4.30[1-6]	4.30[8]	4.30[3-4]		4.30[3]			4.45[31]
Alloy, cold-drawn	5.40[17-52-69-71]	5.40[4-23-69-70-73]	5.40[4] 5.90[74]		5.40[4-32]			5.40[3]	5.40[3]					5.55[84]
Hi str. low alloy, h.r.	5.55[1-5]		5.55[1-8] 6.05[6]	5.55[4]			5.55[1]	5.55[3]	5.55[3]		5.55[3]			
PLATE Carbon steel	3.70[1-5-15]	3.70[1]	3.70[1-6-8]	3.70[4] 4.00[9]			3.70[1-4] 3.95[13]		3.70[3]	4.15[26]	3.70[3]	3.70[3]		
Floor plates			4.75[3]	4.75[5]						4.75[26]				
Alloy	4.75[1] 4.85	4.75[1]	4.75[1]				5.20[13]			5.05[26]	4.75[3]	4.75[3]		
Hi str. low alloy	5.65[1-5]	5.65[1]	5.65[1-8]	5.65[4-5]			5.65[4] 5.70[13]			5.90[26]	5.65[3]	5.65[3]		
SHAPES, Structural	3.65[1-5] 3.90[6]	3.65[1-23]	3.65[1-8]					3.70[3]	3.70[3]		3.70[3]			
Hi str. low alloy	5.50[1-5]	5.50[1]	5.50[1-8]					5.50[3]	5.50[3]		5.50[3]			
MANUFACTURERS' WIRE Bright	4.85[2-5] 5.10[15]	4.85[2] 4.33		4.85[2]				Kokomo—5.80[20]			4.85[3]	4.95[3]	Duluth—4.85[3]	
PILING, Steel Sheet	4.45[1]	4.45[1]	4.45[3]						4.45[3]					

STEEL PRICES

Smaller numbers indicate producing companies. See key at right. Prices are in cents per lb unless otherwise noted. Extras apply.

Kansas City	Houston	Birmingham	WEST COAST Seattle, San Francisco, Los Angeles, Fontana		
			F=$79.00[19]		INGOTS Carbon forging, net ton
	$62.00[83]		F=$80.00[19]		Alloy, net ton
		$56.00[11]	F=$75.00[19]		BILLETS, BLOOMS, SLABS Carbon, rerolling, net ton
	$74.00[83]	$66.00[11]	F=$85.00[19] SF, LA, S=$85.00[62]		Carbon forging billets, net ton
	$78.00[83]		F=$89.00[19] LA=$90.00[62]		Alloy net ton
					PIPE SKELP
	4.50[83]	4.10[4,11]	SF=4.90[2] LA=4.90[24,62]	Worcester=4.40[2] Minnequa=4.35[14]	WIRE RODS
		3.60[4,11]	SF, LA=4.30[24] F=4.55[19]	Niles=5.25[64], Geneva=3.70[16]	SHEETS Hot-rolled (18 ga. & hvr.)
		4.35[11]	SF=5.30[24] F=5.30[19]		Cold-rolled
		4.80[4,11]	SF, LA=5.55[24]	Ashland=4.80[7]	Galvanized (10 gage)
					Enameling (12 gage)
					Long ternes (10 gage)
		5.40[11]	F=6.35[19]		Hi str. low alloy, h.r.
			F=7.50[19]		Hi str. low alloy, c.r.
					Hi str. low alloy, galv.
4.10[83]	4.90[83]	3.50[4]	SF, LA=4.25[24,62] F=4.75[19], S=4.50[62]	Atlanta=4.05[65] Minnequa=4.55[14]	STRIP Hot-rolled
			F=6.30[19] LA=6.40[27]	New Haven=5.15[3], 5.85[68]	Cold-rolled
		5.30[11]	F=6.20[19]		Hi str. low alloy, h.r.
					Hi str. low alloy, c.r.
					TINPLATE Cokes, 1.50-lb base box 1.25 lb, deduct 20¢
Deduct $1.55, $1.30 and 90¢ respectively from 1.50-lb coke base box price					Electrolytic 0.25, 0.50, 0.75 lb box
					BLACKPLATE, 29 gage Hollowware enameling
4.30[83]	4.10[83]	3.70[4,11]	SF, LA=4.40[24]	Atlanta=4.25[65] Minnequa=4.15[14]	BARS Carbon steel
4.30[83]	4.10[83]	3.70[4,11]	SF, S=4.45[62] F=4.40[19], LA=4.40[62]	Atlanta=4.25[65] Minnequa=4.50[14]	Reinforcing‡
				Newark=5.00[69] Putnam=5.10[69] Hartford=5.10[4] Los Angeles=6.00[4]	Cold-finished
4.90[83]	4.70[83]		LA=5.35[62] F=5.35[19]		Alloy, hot-rolled
				Newark=5.75[69] Worcester=[2] Hartford=5.85[4]	Alloy, cold-drawn
		5.55[11]	F=6.60[19]		Hi str. low alloy, h.r.
	4.10[83]	3.70[4,11]	F=4.30[19] S=4.80[62] Geneva=3.70[16]	Claymont=4.15[29] Coatesville=4.15[21] Minnequa=4.50[14]	PLATE Carbon steel
				Harrisburg=5.25[35]	Floor plates
			F=5.70[19] Geneva=5.65[16]	Coatesville=5.25[21] Claymont=4.85[29]	Alloy
		5.65[11]	F=6.25[19]		Hi str. low alloy
4.25[83]	4.05[83]	3.65[4,11]	SF=4.20[62] F=4.25[16] LA=4.25[24,62] S=4.30[62]	Geneva 3.85[16] Minnequa 4.10[14]	SHAPES, Structural
		50[11]	F=6.10[19]		Hi str. low alloy
5.45[83]	5.25[83]	4.85[4,11]	SF, LA=5.80[24]	Atlanta=5.10[65] Worcester=5.15[2] Minnequa=5.10[14]	MANUFACTURERS' WIRE Bright

KEY TO STEEL PRODUCERS

1 U. S. Steel Co., Pittsburgh
2 American Steel & Wire Co., Cleveland
3 Bethlehem Steel Co., Bethlehem
4 Republic Steel Corp., Cleveland
5 Jones & Laughlin Steel Corp., Pittsburgh
6 Youngstown Sheet & Tube Co., Youngstown
7 Arco Steel Corp., Middletown, Ohio
8 Inland Steel Co., Chicago
9 Weirton Steel Co., Weirton, W. Va.
10 National Tube Co., Pittsburgh
11 Tennessee Coal, Iron & R. R. Co., Birmingham
12 Great Lakes Steel Corp., Detroit
13 Sharon Steel Corp., Sharon, Pa.
14 Colorado Fuel & Iron Corp., Denver
15 Wheeling Steel Corp., Wheeling, W. Va.
16 Geneva Steel Co., Salt Lake City
17 Crucible Steel Co. of America, New York
18 Pittsburgh Steel Co., Pittsburgh
19 Kaiser Steel Corp., Oakland, Calif.
20 Portsmouth Div., Detroit Steel Corp., Detroit
21 Lukens Steel Co., Coatesville, Pa.
22 Granite City Steel Co., Granite City, Ill.
23 Wisconsin Steel Co., South Chicago, Ill.
24 Columbia Steel Co., San Francisco
25 Copperweld Steel Co., Glassport, Pa.
26 Alan Wood Steel Co., Conshohocken, Pa.
27 Calif. Cold Rolled Steel Corp., Los Angeles
28 Allegheny Ludlum Steel Corp., Pittsburgh
29 Worth Steel Co., Claymont, Del.
30 Continental Steel Corp., Kokomo, Ind.
31 Rotary Electric Steel Co., Detroit
32 Laclede Steel Co., St. Louis
33 Northwestern Steel & Wire Co., Sterling, Ill.
34 Keystone Steel & Wire Co., Peoria, Ill.
35 Central Steel & Wire Co., Harrisburg, Pa.
36 Carpenter Steel Co., Reading, Pa.
37 Eastern Stainless Steel Corp., Baltimore
38 Washington Steel Corp., Washington, Pa.
39 Jessop Steel Co., Washington, Pa.
40 Blair Strip Steel Co., New Castle, Pa.
41 Superior Steel Corp., Carnegie, Pa.
42 Timken Steel & Tube Div., Canton, Ohio
43 Babcock & Wilcox Tube Co., Beaver Falls, Pa.
44 Reeves Steel & Mfg. Co., Dover, Ohio
45 John A. Roebling's Sons Co., Trenton, N. J.
46 Simonds Saw & Steel Co., Fitchburg, Mass.
47 McLouth Steel Corp., Detroit
48 Cold Metal Products Co., Youngstown
49 Thomas Steel Co., Warren, Ohio
50 Wilson Steel & Wire Co., Chicago
51 Sweet's Steel Co., Williamsport, Pa.
52 Superior Drawn Steel Co., Monaca, Pa.
53 Tremont Nail Co., Wareham, Mass.
54 Firth Sterling St. & Carbide Corp., McKeesport
55 Ingersoll Steel Div., Chicago
56 Phoenix Iron & Steel Co., Phoenixville, Pa.
57 Fitzsimmons Steel Co., Youngstown
58 Stanley Works, New Britain, Conn.
59 Universal-Cyclops Steel Corp., Bridgeville, Pa.
60 American Cladmetals Co., Carnegie, Pa.
61 Cuyahoga Steel & Wire Co., Cleveland
62 Bethlehem Pacific Coast Steel Corp., San Fran.
63 Follansbee Steel Corp., Pittsburgh
64 Niles Rolling Mill Co., Niles, Ohio
65 Atlantic Steel Co., Atlanta
66 Acme Steel Co., Chicago
67 Joslyn Mfg. & Supply Co., Chicago
68 Detroit Steel Corp., Detroit
69 Wycoff Steel Co., Pittsburgh
70 Bliss & Laughlin, Inc., Harvey, Ill.
71 Columbia Steel & Shafting Co., Pittsburgh
72 Cumberland Steel Co., Cumberland, Md.
73 La Salle Steel Co., Chicago
74 Monarch Steel Co., Inc., Hammond, Ind.
75 Empire Steel Co., Mansfield, Ohio
76 Mahoning Valley Steel Co., Niles, Ohio
77 Oliver Iron & Steel Co., Pittsburgh
78 Pittsburgh Screw & Bolt Co., Pittsburgh
79 Standard Forging Corp., Chicago
80 Driver Harris Co., Harrison, N. J.
81 Detroit Tube & Steel Div., Detroit
82 Reliance Div., Eaton Mfg. Co., Massillon, Ohio
83 Sheffield Steel Corp., Kansas City
84 Plymouth Steel Co., Detroit
85 Wickwire Spencer Steel, Buffalo
86 Angell Nail and Chaplet, Cleveland
87 Mid-States Steel & Wire, Crawfordsville, Ind.
88 National Supply, Pittsburgh, Pa.
89 Wheatland Tube Co., Wheatland, Pa.
90 Mercer Tube & Mfg. Co., Sharon, Pa.
91 Woodward Iron Co., Woodward, Ala.
92 Sloss-Sheffield Steel & Iron Co., Birmingham
93 Hanna Furance Corp., Detroit
94 Interlake Iron Corp., Cleveland
95 Lone Star Steel Co., Dallas
96 Mystic Iron Works, Everett, Mass.
97 Jackson Iron & Steel Co., Jackson, O.
98 Globe Iron Co., Jackson, O.
99 Pittsburgh Coke & Chemical Co., Pittsburgh
100 Shenango Furnace Co., Pittsburgh
101 Tennessee Products & Chemical Corp., Nashville
102 Koppers Co., Inc., Granite City, Ill.

STAINLESS STEELS

Base price, cents per lb, f. o. b. mill.

Product	301	302	303	304	316	321	347	410	416	430
Ingots, rerolling	14.25	15.00	16.50	16.00	24.25	19.75	21.50	12.75	14.75	13.00
Slabs, billets rerolling	18.50	19.75	21.75	20.75	31.75	26.00	28.25	16.50	20.00	16.75
Forg. discs, die blocks, rings	34.00	34.00	36.50	35.50	52.50	40.00	44.50	28.00	28.50	28.50
Billets, forging	26.25	26.25	28.25	27.50	41.00	31.00	34.75	21.50	22.00	22.00
Bars, wires, structurals	31.25	31.25	33.75	32.75	48.75	36.75	41.25	25.75	26.25	26.25
Plates	33.00	33.00	35.00	35.00	51.50	40.50	45.00	27.00	27.50	27.50
Sheets	41.00	41.00	43.00	43.00	56.50	49.00	53.50	36.50	37.00	39.00
Strip, hot-rolled	26.50	28.00	32.25	30.00	48.25	36.75	41.00	23.50	30.25	24.00
Strip, cold-rolled	34.00	36.50	40.00	38.50	58.50	48.00	52.00	30.50	37.00	31.00

STAINLESS STEEL PRODUCING POINTS—*Sheets:* Midland, Pa., 17; Brackenridge, Pa., 28; Butler, Pa., 7; McKeesport, Pa., 1; Washington, Pa., 28 (type 316 add 5¢), 39; Baltimore, 37; Middletown, Ohio, 7; Massillon, Ohio, 4; Gary, 1; Bridgeville, Pa., 59; New Castle, Ind., 55; Ft. Wayne, Ind., 67; Lockport, N. Y., 46.

Strip: Midland, Pa., 17; Cleveland, 2; Carnegie, Pa., 41; McKeesport, Pa., 54; Reading, Pa., 36; Washington, Pa., 39; (type 316 add 5¢); W. Leechburg, Pa., 28; Bridgeville, Pa., 59; Detroit, 47; Massillon, Canton, Ohio, 4; Middletown, Ohio, 7; Harrison, N. J., 80; Youngstown, 48; Lockport, N. Y., 46; New Britain, Conn., 58; Sharon, Pa., 13; Butler, Pa., 7.

Bars: Baltimore, 7; Duquesne, Pa. 1; Munhall, Pa., 1; Reading, Pa., 36; Titusville, Pa., 59; Washington, Pa., 39; McKeesport, Pa., 1, 54; Bridgeville, Pa., 59; Dunkirk, N. Y., 28; Massillon, Ohio, 4; Chicago, 1; Syracuse, N. Y., 17; Watervliet, N. Y., 28; Waukegan, Ill., 2; Lockport, N. Y., 46; Canton, Ohio, 42; Ft. Wayne, Ind., 67.

Wire: Waukegan, Ill., 2; Massillon, Ohio, 4; McKeesport, Pa., 54; Bridgeport, Conn., 44; Ft. Wayne, Ind., 67; Trenton, N. J., 45; Harrison, N. J., 80; Baltimore, 7; Dunkirk, 28.

Structurals: Baltimore, 7; Massillon, Ohio, 4; Chicago, 1, 67; Watervliet, N. Y., 28; Bridgeport, Conn., 44.

Plates: Brackenridge, Pa., 28 (type 416 add ½¢); Butler, Pa., 7; Chicago, 1; Munhall, Pa., 1; Midland, Pa., 17; New Castle, Ind., 55; Lockport, N. Y., 46; Middletown, 7; Washington, Pa., 39; Cleveland, Massillon, 4.

Forged discs, die blocks, rings: Pittsburgh, 1, 17; Syracuse, 17; Ferndale, Mich., 28.

Forging billets: Midland, Pa., 17; Baltimore, 7; Washington, Pa., 39; McKeesport, 54; Massillon, Canton, Ohio, 4; Watervliet, 28; Pittsburgh, Chicago, 1.

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard & Coated Nails Base Col.	Woven Wire Fence 9-15½ ga. Base Col.	Fence Posts Base Col.	Single Loop Bale Ties Base Col.	Twisted Barbless Wire Base Col.	Gal. Barbed Wire Base Col.	Merch. Wire Ann'ld. ¢/lb.	Merch. Wire Gal. ¢/lb.
Alabama City-4	118	126	...	123	...	136	5.70	5.95
Aliquippa, Pa.-5	118	132	...	...	136	140	5.70	6.15
Atlanta-65	113	133	...	126	126	143	5.95	6.40
Bartonville-34	118	130	140	123	143	143	5.95	6.15
Buffalo-85	...	...	...	...	...	...	4.85	...
Cleveland-86	125	...	...	...	...	...	...	...
Cleveland-2	...	...	...	...	...	...	5.70	6.15
Crawfordsville-87	...	132	...	...	...	145	5.95	6.40
Donora, Pa.-2	118	130	...	123	...	140	5.70	6.15
Duluth-2	118	130	...	123	...	140	5.70	6.15
Fairfield, Ala.-11	118	130	...	123	...	136	5.70	6.15
Houston-83	126	138	...	...	...	148	6.10	6.55
Johnstown, Pa.-3	118	130	...	...	140	...	5.70	6.15
Joliet, Ill.-2	118	130	...	123	...	140	5.70	6.15
Kokomo, Ind.-30	120	132	...	125	138	138	5.80	6.05
Los Angeles-62	...	...	...	...	...	...	6.65	...
Kansas City-83	130	130	142	135	...	152	6.30	6.75
Minnequa-14	123	138	130	128	146	146	5.95	6.45
Monessen-18	124	135	...	...	...	145	5.95	6.40
Moline, Ill.-4	...	...	136	...	...	...	...	...
Palmer-85	...	...	...	...	...	...	...	...
Pittsburg, Cal.-24	137	149	...	147	156	160	6.65	6.80
Portsmouth-20	124	137	...	...	147	147	6.10	6.60
Rankin, Pa.-2	118	130	...	...	...	140	5.70	6.15
So. Chicago, Ill.-4	118	126	140	123	...	136	5.70	5.95
S. San Fran.-14	...	...	...	147	...	160	6.65	7.10
Sparrows Pt.-3	120	...	...	125	142	142	5.80	6.25
Sterling, Ill.-33	118	130	140	123	140	140	5.70	6.15
Struthers, Ohio-6	...	...	...	...	...	...	5.70	6.15
Torrance, Cal.-24	138	...	...	...	...	...	6.65	...
Worcester-2	124	...	...	...	...	...	6.00	6.45
Williamsport, Pa.-51	...	...	150	...	...	...	...	...

Cut Nails, carloads, base, $6.75 per 100 lb. (less 20¢ to jobbers) at Conshohocken, Pa., (26), Wareham, Mass. (53) Wheeling, W. Va., (15).

CAST IRON WATER PIPE

	Per net ton
6 to 24-in., del'd Chicago	$105.30 to $108.80
6 to 24-in., del'd N. Y.	108.50 to 109.50
6 to 24-in., Birmingham	91.50 to 96.00
6-in. and larger, f.o.b. cars, San Francisco, Los Angeles, for all rail shipment; rail and water shipment less	$108.50 to $113.00

Class "A" and gas pipe, $5 extra; 4-in. pipe is $5 a ton above 6-in.

PIPE AND TUBING

Base discounts, f.o.b. mills. Base price about $200 per net ton.

	BUTTWELD														SEAMLESS					
	½ In.		¾ In.		1 In.		1¼ In.		1½ In.		2 In.		2½-3 In.		2 In.		2½-3 In.		3½-4 In.	
	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
STANDARD T. & C.																				
Sparrows Pt.-3	34.0	12.0	37.0	16.0	39.5	19.5	40.0	20.0	40.5	21.0	41.0	21.5	41.5	22.0	...	...	...	...	...	...
Cleveland-4	36.0	14.0	39.0	18.0	41.5	21.5	42.0	22.0	42.5	23.0	43.0	23.5	43.5	24.0	...	...	...	...	...	...
Oakland-19	28.0	3.0	28.0	7.0	30.5	10.5	31.0	21.0	31.5	22.0	32.0	12.5	32.5	13.0	...	...	...	...	...	...
Pittsburgh-5	36.0	14.0	39.0	17.0	41.5	19.5	42.0	20.5	42.5	21.0	43.0	21.5	43.5	22.5	29.5	8.0	32.5	11.5	34.5	13.5
Pittsburgh-10	36.0	14.0	39.0	18.0	41.5	21.5	42.0	22.0	42.5	23.0	43.0	23.5	43.5	24.0	29.5	9.5	32.5	12.5	34.5	14.5
St. Louis-32	35.0	13.0	38.0	17.0	40.5	20.5	41.0	21.0	41.5	22.0	42.0	22.5	42.5	23.0	...	...	...	...	...	...
Sharon-90	36.0	13.0	39.0	17.0	41.5	20.0	42.0	20.5	42.5	21.0	43.0	21.5	43.5	22.0	...	...	...	...	...	...
Toledo-88	36.0	14.0	39.0	18.0	41.5	21.5	42.0	22.0	42.5	23.0	43.0	23.5	43.5	24.0	29.5	...	32.5	...	34.5	...
Wheeling-15	36.0	14.0	39.0	18.0	41.5	21.5	42.0	22.0	42.5	23.0	43.0	23.5	43.5	24.0	...	...	...	...	...	...
Wheatland-89	36.0	14.0	39.0	17.0	41.5	19.5	42.0	20.5	42.5	21.0	43.0	21.5	43.5	22.5	...	...	...	...	...	...
Youngstown-6	36.0	14.0	39.0	18.0	41.5	21.5	42.0	22.0	42.5	23.0	43.0	23.5	43.5	24.0	29.5	9.5	32.5	12.5	34.5	14.5
EXTRA STRONG, PLAIN ENDS																				
Sparrows Pt.-3	33.5	13.0	37.5	17.0	39.5	20.5	40.0	21.0	40.5	22.0	41.0	22.5	41.5	23.0	...	...	...	...	...	...
Cleveland-4	35.5	15.0	39.5	19.0	41.5	22.5	42.0	23.0	42.5	24.0	43.0	24.5	43.5	25.0	...	...	...	...	...	...
Oakland-19	24.5	4.0	28.5	18.0	30.5	11.5	31.0	12.0	31.5	13.0	32.0	13.5	32.5	14.0	...	...	...	...	...	...
Pittsburgh-5	35.5	13.5	39.5	17.5	41.5	19.5	42.0	20.5	42.5	21.0	43.0	21.5	43.5	22.5	29.0	7.5	33.0	12.0	36.0	15.5
Pittsburgh-10	35.5	15.0	39.5	19.0	41.5	22.5	42.0	23.0	42.5	24.0	43.0	24.5	43.5	25.0	29.0	10.0	33.0	14.0	36.5	17.5
St. Louis-32	34.5	14.0	38.5	18.0	40.5	21.5	41.0	22.0	41.5	23.0	42.0	23.5	42.5	24.0	...	...	...	...	...	...
Sharon-90	35.5	14.0	39.5	18.0	41.5	21.0	42.0	21.5	42.5	22.0	43.0	22.5	43.5	23.0	...	...	...	...	...	...
Toledo-88	35.5	15.0	39.5	19.0	41.5	22.5	42.0	23.0	42.5	24.0	43.0	24.5	43.5	25.0	29.0	...	33.0	...	36.5	...
Wheeling-15	35.5	15.0	39.5	19.0	41.5	22.5	42.0	23.0	42.5	24.0	43.0	24.5	43.5	25.0	...	...	...	...	...	...
Wheatland-89	35.5	13.5	39.5	17.5	41.5	19.5	42.0	20.5	42.5	21.0	43.0	21.5	43.5	22.5	...	...	...	...	...	...
Youngstown-6	35.5	15.0	39.5	19.0	41.5	22.5	42.0	23.0	42.5	24.0	43.0	24.5	43.5	25.0	29.0	10.0	33.0	14.0	36.5	17.5

Galvanized discounts based on zinc at 17¢ per lb, East St. Louis. For each 1¢ change in zinc, discounts vary as follows: ½ in., ¾ in., and 1 in., 1 pt.; 1¼ in., 1½ in., 2 in., ¾ pt.; 2½ in., 3 in., ½ pt. Calculate discounts on even cents per lb of zinc, i.e., if zinc is 16.51¢ to 17.50¢ per lb, use 17¢. Jones & Laughlin discounts apply only when zinc price changes 1¢. Threads only, buttweld and seamless, 1 pt. higher discount. Plain ends, buttweld and seamless, 3 in. and under, 3½ pts. higher discount. Buttweld jobbers' discount, 5 pct.

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Axles	Screw Spikes	Tie Plates	Track Bolts Untreated
Bessemer-1	3.60	4.00	4.70	...	...	...	...	...
Chicago-4	...	...	...	6.15	...	...	...	...
Ensley-11	3.60	4.00	...	...	...	...	...	...
Fairfield-11	...	4.00	4.40	...	...	8.60	4.50	...
Gary-1	3.60	4.00	...	...	...	...	4.50	...
Ind. Harbor-6	3.60	...	4.70	6.15	5.25	8.60	4.50	...
Johnstown-3	...	4.00	...	...	5.60	8.60	...	...
Joliet-1	...	4.00	4.70	...	...	...	...	...
Kansas City-83	...	...	...	6.40	...	...	...	...
Lackawanna-3	3.60	4.00	4.70	...	...	8.60	4.50	...
Lebanon-3	...	...	...	6.15	...	...	...	9.85
Minnequa-14	3.60	4.50	4.70	6.15	...	8.60	4.50	9.85
Pittsburgh-77	...	...	...	...	...	9.35	...	9.85
Pittsburgh-78	...	...	...	...	...	...	...	9.85
Pittsburgh-5	...	...	...	6.15	...	...	...	...
Pittsburg-24	...	...	...	...	...	...	4.65	...
Seattle-62	...	...	...	6.10	...	...	4.35	...
Steelton-3	3.60	...	4.70	...	...	...	4.50	...
Struthers-6	...	...	...	6.15	...	...	...	...
Torrance-24	...	...	...	...	...	...	4.65	...
Youngstown-4	...	...	...	6.15	...	...	...	...

Track Bolts, heat treated, to railroads, 9.85¢ per lb.

BOILER TUBES

Seamless steel, electric welded commercial boiler tubes, locomotive tubes, minimum wall, per 100 ft at mill, c.l. lots, cut lengths 10 to 24 ft.

OD in In.	gage BWG	Seamless H.R.	Seamless C.D.	Electric Weld H.R.	Electric Weld C.D.
2	13	$22.67	$26.66	$21.99	$25.86
2½	12	30.48	35.84	29.57	34.76
3	12	33.90	39.90	32.89	34.80
3½	11	42.37	49.89	41.10	48.39
4	10	52.60	61.88	51.03	60.03

Pittsburgh Steel add, H-R: 2 in., 62¢; 2½ in., 84¢; 3 in., 92¢; 3½ in., $1.17; 4 in., $1.45. Add, C-R: 2 in., 74¢; 2½ in., 99¢; 3 in., $1.10; 3½ in., $1.37; 4 in., $1.70.

FLUORSPAR

Washed gravel fluorspar, f.o.b. cars, Rosiclare, Ill. Base price, per ton net: Effective CaF, content:

70% or more	$43.00
60% or less	40.00

WAREHOUSES

Base price, f.o.b., dollars per 100 lb. *(Metropolitan area delivery, add 20¢ except Birmingham, San Francisco, Cincinnati, New Orleans, St. Paul, add 15¢; Memphis, add 10¢; Philadelphia, add 25¢; New York, add 30¢).

Cities	Sheets			Strip		Plates	Shapes	Bars		Alloy Bars			
	Hot-Rolled	Cold-Rolled (18 gage)	Galvanized (10 gage)	Hot-Rolled	Cold-Rolled		Standard Structural	Hot-Rolled	Cold-Finished	Hot-Rolled A 4615 As rolled	Hot-Rolled A 4140 Annealed	Cold-Drawn A 4615 As rolled	Cold-Drawn A 4140 Annealed
Baltimore	5.60	6.84	7.49[2]–8.07	6.04	.....	5.80	6.14	6.04	6.84–6.89	10.24	10.54	11.89	12.19
Birmingham*	5.60	6.40	6.75	5.55	.....	5.95	5.70	5.55	.....	.....	.....	.....	.....
Boston	6.20	7.00–7.25	7.74–8.29	6.15	8.50[4]	6.48–6.78	6.20	6.05	6.79–6.84	10.25	10.55	11.90–12.00	12.20–12.30
Buffalo	5.60	6.40	7.74–8.09	5.86	.....	6.05	5.80	5.60	6.40–6.45	10.15–10.85	10.45	11.80	11.95–12.10
Chicago	5.60	6.40	7.75	5.55	.....	5.80	5.70	5.55	6.30	9.80	10.10	11.45	11.75
Cincinnati*	5.87	6.44	7.39	5.80	.....	6.19	6.09	5.80	6.61	10.15	10.45	11.80	12.10
Cleveland	5.60	6.40	8.10	5.69	6.90	5.92	5.82	5.57	6.40	9.91	10.21	11.56	11.86
Detroit	5.78	6.53	7.89	5.94	.....	5.99	6.09	5.84	6.	10.11	10.41	11.76	12.06
Houston	7.00	8.25	.....	.....	.....	6.85	6.50	6.65	9.35	10.35	11.25	.....	12.75
Indianapolis, del'd	6.00	6.80	8.15	5.95	.....	6.20	6.10	5.95	6.80	.....	.....	.....	.....
Kansas City	5.00	6.80	7.45	6.15	7.50	6.40	6.30	6.15	7.00	10.40	10.70	12.05	12.35
Los Angeles	6.35	7.90	8.85	6.40	9.45[5]	6.40	6.35	6.35	8.20	11.30	11.30	13.20	13.50
Memphis*	6.33–6.38	7.08–7.18	.....	6.33–6.38	.....	6.43–8.02	6.33–6.48	6.08–6.33	7.16–7.32	.....	.....	.....	.....
Milwaukee	5.74	6.54	7.89	5.69–6.59	.....	5.94	5.84	5.69	6.44–6.54	9.94	10.24	11.59	11.89
New Orleans*	5.70	6.59	.....	5.75	7.25	5.95	5.75	5.75	7.30	.....	.....	.....	.....
New York*	5.67–5.97	7.19[5]–7.24[1]	8.14[2]	6.29–6.89	8.63[4]	6.28–6.58	6.10	6.12	6.99	10.05–10.15	10.35–10.45	11.70–11.80	12.10–12.20
Norfolk	6.50[3]	.....	.....	.....	.....	6.50[3]	6.60[3]	6.55[3]	.....	.....	.....	.....	.....
Philadelphia*	5.90	6.80	8.00	6.10	.....	6.05	5.90	6.05	6.86	9.90	10.20	.....	.....
Pittsburgh	5.60	6.40	7.75	5.65–5.95	.....	5.75	5.70	5.55	6.15	9.80	10.10	11.45	11.75
Portland	6.60–7.55	8.95	8.50–9.10	7.30	.....	6.80	6.95	6.90	.....	.....	12.15	.....	.....
Salt Lake City	7.95	.....	9.70–10.50[2]	8.70–8.75	.....	8.05	6.75–8.30	7.95–8.65	9.00	.....	.....	.....	.....
San Francisco*	8.65	8.05[3]	8.55–8.90[2]	6.60	9.45[5]	6.50	6.45	6.45	8.20	11.30	11.30	13.20	13.20–13.50
Seattle	7.05	8.60	9.20	9.05	.....	6.75	6.85	6.75	9.05	.....	.....	.....	.....
St. Louis	5.80–5.85	6.65	8.00	5.80	8.00[4]–8.28	6.13	6.03	5.80	6.55–6.65	10.05	10.35	11.70	12.00
St. Paul*	6.16	6.96	8.31	6.11	.....	6.36	6.26	6.11	6.96	10.36	10.66	12.01	12.31

BASE QUANTITIES (Standard unless otherwise keyed): Cold finished bars; 2000 lb or over. Alloy bars; 1000 to 1999 lb. All others; 2000 to 9999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may not be combined with each other or with galvanized sheets for quantity.

EXCEPTIONS: (1) 400 to 1499 lb; (2) 450 to 1499 lb; (3) 400 to 1999 lb; (4) 6000 lb and over; (5) 1500 to 9999 lb.; (6) 2000 to 5999 lb.

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

Producing Point	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.	Blast Furnace Silvery	Low Phos. Charcoal
Bethlehem-3	54.00	54.50	55.00	55.50	.....	.....	.....
Birmingham-4	48.38	48.88	.....	.....	.....	.....	.....
Birmingham-91	48.38	48.88	.....	.....	.....	.....	.....
Birmingham-92	48.38	48.88	.....	.....	.....	.....	.....
Buffalo-4	52.00	52.50	53.00	.....	.....	.....	.....
Buffalo-93	52.00	52.50	53.00	.....	.....	63.75	.....
Chicago-94	52.00	52.50	52.50	53.00	.....	.....	.....
Cleveland-2	52.00	52.50	52.50	53.00	57.00	.....	.....
Cleveland-4	52.00	52.50	52.50	.....	.....	.....	.....
Daingerfield, Tex.-95	48.00	48.50	48.50	.....	.....	.....	.....
Duluth-94	52.00	52.50	52.50	53.00	.....	.....	.....
Erie-94	52.00	52.50	52.50	53.00	.....	.....	.....
Everett, Mass.-96	.....	53.25	53.75	.....	.....	.....	.....
Fontana-19	58.00	58.50	.....	.....	.....	.....	.....
Geneva, Utah-16	52.00	52.50	52.50	53.00	.....	.....	.....
Granite City, Ill.-102	53.90	54.40	54.90	.....	.....	.....	.....
Hubbard, O.-6	52.00	52.50	52.50	.....	.....	.....	.....
Ironton, Utah-16	52.00	52.50	.....	.....	.....	.....	.....
Jackson, O.-97,98	.....	.....	.....	.....	.....	62.50	.....
Lyle, Tenn.-101	.....	.....	.....	.....	.....	.....	86.00
Menessen-18	54.00	.....	.....	.....	.....	.....	.....
Neville Island-99	52.00	52.50	52.50	53.00	.....	.....	.....
Pittsburgh-1	52.00	.....	.....	53.00	.....	.....	.....
Sharpsville-100	52.00	52.50	52.50	53.00	.....	.....	.....
Steelton-3	54.00	54.50	55.00	55.50	60.00	.....	.....
Swedeland-26	56.00	56.50	57.00	57.50	.....	.....	.....
Toledo-94	52.00	52.50	52.50	53.00	.....	.....	.....
Troy, N. Y.-4	54.00	54.50	55.00	.....	60.00	.....	.....
Youngstown-6	52.00	52.50	52.50	53.00	.....	.....	.....

DIFFERENTIALS: Add 50¢ per ton for each 0.25 pct silicon over base (1.75 to 2.25 pct), 50¢ per ton for each 0.50 pct manganese over 1 pct, $2 per ton for 0.5 to 0.75 pct nickel, $1 for each additional 0.25 pct nickel. Subtract 38¢ per ton for phosphorus content over 0.70 pct. Silvery iron: Add $1.50 per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 17 pct. $1 per ton for 0.75 pct or more phosphorus, manganese as above. Bessemer ferrosilicon prices are $1 over comparable silvery iron.

REFRACTORIES

Fire Clay Brick *(F.o.b. works) Carloads, Per 1000*

First quality, Ill., Ky., Md., Mo., Ohio, Pa (except Salina, Pa., add $5)	$94.60
No. 1 Ohio	88.00
Sec. quality, Pa., Md., Ky., Mo., Ill.	88.00
No. 2 Ohio	79.20
Ground fire clay, net ton, bulk (except Salina, Pa., add $1.50)	13.70

Silica Brick

Mt. Union, Pa., Ensley, Ala.	$94.60
Childs, Pa.	99.00
Hays, Pa.	100.10
Chicago District	104.50
Western Utah and Calif.	111.10
Super Duty, Hays, Pa., Athens, Tex., Chicago	111.10
Silica cement, net ton, bulk, Eastern (except Hays, Pa.)	16.50
Silica cement, net ton, bulk, Hays, Pa.	18.70
Silica cement, net ton, bulk, Ensley, Ala.	17.60
Silica cement, net ton, bulk, Chicago District	17.60
Silica cement, net ton, bulk, Utah and Calif.	24.70

Chrome Brick *Per Net Ton*

Standard chemically bonded, Balt. Chester	$82.00

Magnesite Brick

Standard, Baltimore	$104.00
Chemically bonded, Baltimore	93.00

Grain Magnesite *Bt. ⅜-in. grains*

Domestic, f.o.b. Baltimore, in bulk fines removed	$61.70
Domestic, f.o.b. Chewelah, Wash., in bulk	36.30
in sacks	41.80

Dead Burned Dolomite

F.o.b. producing points in Pennsylvania, West Virginia and Ohio, per net ton, bulk Midwest, add 10¢; Missouri Valley, add 20¢	$12.00

COKE

	Net Ton
Furnace, beehive (f.o.b. oven) Connellsville, Pa.	$14.00 to $14.50
Foundry, beehive (f.o.b. oven) Connellsville, Pa.	$17.00 to $17.50
Foundry, oven coke	
Buffalo, del'd	$25.35
Chicago, f.o.b.	21.00
Detroit, f.o.b.	23.00
New England, del'd	24.80
Seaboard, N. J., f.o.b.	22.00
Philadelphia, f.o.b.	22.70
Swedeland, Pa., f.o.b.	22.60
Plainesville, Ohio, f.o.b.	24.00
Erie, Pa., f.o.b.	23.50
Cleveland, del'd	25.75
Cincinnati, del'd	25.06
St. Paul, f.o.b.	21.00
St. Louis, f.o.b.	24.90
Birmingham, del'd	20.79
Neville Island, f.o.b.	23.00

LAKE SUPERIOR ORES

(51.50% *Fe; natural content, delivered lower lake ports*)

	Per gross ton
Old range, bessemer	$8.70
Old range, nonbessemer	8.55
Mesabi, bessemer	8.45
Mesabi, nonbessemer	8.30
High phosphorus	8.30

After adjustments for analyses, prices will be increased or decreased as the case may be for increases or decreases after Dec. 2, 1950, in lake vessel rates, upper lake rail freights, dock handling charges and taxes thereon.

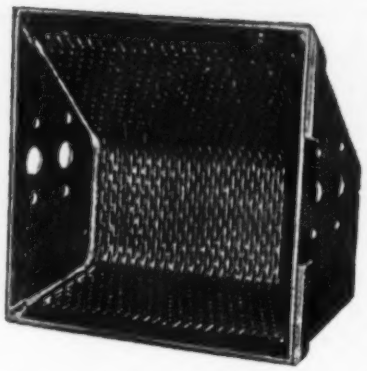
C-R SPRING STEEL

Base per pound f.o.b. mill

0.26 to 0.40 carbon	5.35¢
0.41 to 0.60 carbon	6.80¢
0.61 to 0.80 carbon	7.40¢
0.81 to 1.05 carbon	9.35¢
1.06 to 1.35 carbon	11.65¢

Worcester, add 0.30¢; Sharon, Carnegie-New Castle, add 0.35¢; Detroit, 0.26 to 0.40 carb., add 25¢; other grades add 15¢. New Haven, 0.26 to 0.40 carb., add 50¢; other grades add 5¢.

Typical of Hendrick's Manufacturing Facilities



Hendrick is exceptionally well equipped to manufacture to specifications a wide range of metal products that involve such operations as perforating, shaping, forming, welding, brazing, riveting, etc. The perforated elevator bucket illustrated is typical of the many specialized articles for whose fabrication Hendrick has unusual facilities. Write in detail regarding any metal product you desire fabricated.

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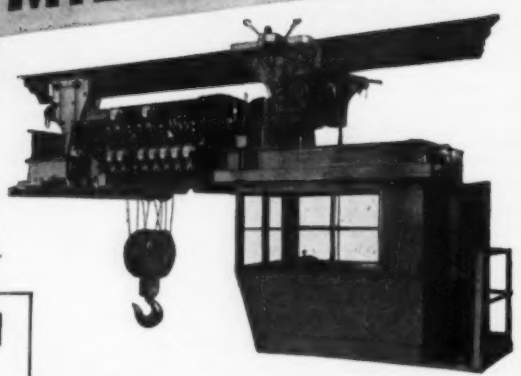
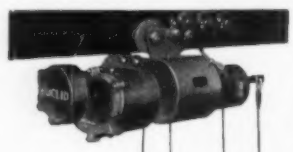


Write for Literature Describing EUCLID CRANES and HOISTS.



Euclid offers a complete line of hoists in varied types and capacities, incorporating many design features not found in other hoists.

• This 15 ton Heavy Duty Mill Type Hoist is designed and built especially to render efficient, economical service.

It features: MILL TYPE MOTORS—MAGNETIC CONTROL—MASTER SWITCHES IN CAB—DYNAMIC LOWERING—HYDRAULIC TROLLEY BRAKE—SPRING BUMPERS—SAFETY FACTOR OF 8.

Here is *power* when you want it and *strength* where you need it with coordinated precision control for ease of operation.

EUCLID CRANES AND HOISTS *Raise Profits*

THE EUCLID CRANE & HOIST CO.

1361 CHARDON ROAD • EUCLID, OHIO

BOLTS, NUTS, RIVETS, SCREWS

Consumer Prices

(Base discount, f.o.b. mill, Pittsburgh, Cleveland, Birmingham or Chicago)

Machine and Carriage Bolts

	Pct Off List Less Case	C.
½ in. & smaller x 6 in. & shorter	15	28½
9/16 in. & ⅝ in. x 6 in. & shorter	18½	30½
¾ in. & larger x 6 in. & shorter	17½	29½
All diam. longer than 6 in.	14	27½
Lag, all diam. x 6 in. & shorter	23	35
Lag, all diam. longer than 6 in.	21	33
Plow bolts	34	...

Nuts, Hot Pressed, Cold Punched—Sq

	Pct Off List Less Keg (Reg.)	K.	Less Keg. (Hvy.)	K.
½ in. & smaller	15	28½	15	28½
9/16 in. & ⅝ in.	12	25	6½	21
¾ in. to 1½ in. inclusive	9	23	1	16½
1⅝ in. & larger	7½	22	1	16½

Nuts, Hot Pressed—Hexagon

½ in. & smaller	26	37	22	34
9/16 in. & ⅝ in.	16½	29½	6½	21
¾ in. to 1½ in. inclusive	12	25	2	17½
1⅝ in. & larger	8½	23	2	17½

Nuts, Cold Punched—Hexagon

½ in. & smaller	26	37	22	34
9/16 in. & ⅝ in.	23	35	17½	30½
¾ in. to 1½ in. inclusive	19½	31½	12	25
1⅝ in. & larger	12	25	6½	21

Nuts, Semi-Finished—Hexagon

	Reg.		Hvy.	
½ in. & smaller	35	45	28½	39½
9/16 in. & ⅝ in.	29½	40½	22	34
¾ in. to 1½ in. inclusive	24	36	15	28½
1⅝ in. & larger	13	26	8½	23
	Light			
7/16 in. & smaller	35	45		
½ in. thru ⅝ in.	28½	39½		
¾ in. to 1½ in. inclusive	26	37		

Stove Bolts

	Pct Off List
Packaged, steel, plain finished	56—10
Packaged, plated finish	41—10
Bulk, plain finish**	67*

*Discounts apply to bulk shipments in not less than 15,000 pieces of a size and kind where length is 3-in. and shorter; 5000 pieces for lengths longer than 3-in. For lesser quantities, packaged price applies.

**Zinc, Parkerized, cadmium or nickel plated finishes add 6¢ per lb net. For black oil finish, add 2¢ per lb net.

Rivets

	Base per 100 lb
½ in. & larger	$7.85
	Pct Off List
7/16 in. & smaller	16

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham, Lebanon, Pa.

Cap and Set Screws

(In bulk)	Pct Off List
Hexagon head cap screws, coarse or fine thread, ¼ in. thru ⅝ in. x 6 in., SAE 1020, bright	54
⅝ in. thru 1 in. up to & including 6 in.	48
¼ in. thru ⅝ in. x 6 in. & shorter high C double heat treat	46
⅝ in. thru 1 in. up to & including 6 in.	41
Milled studs	35
Flat head cap screws, listed sizes	16
Fillister head cap, listed sizes	34
Set screws, sq head, cup point, 1 in. diam. and smaller x 6 in. & shorter	53

S. M. Ferrochrome

Contract price, cents per pound, chromium contained, lump size, delivered.

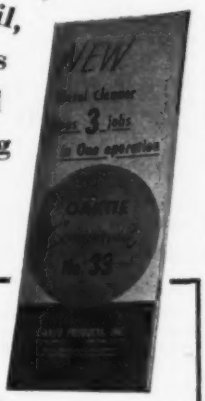
High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.

Carloads	21.60
Ton lots	23.75
Less ton lots	25.35

Low carbon type: 62-66% Cr, 4-6% Si, 4-6% Mn, 1.25% max. C.

Carloads	27.75
Ton lots	30.05
Less ton lots	31.85

All at one time . . .
it removes rust,
removes oil,
prepares
the metal
for painting



This FREE Folder Tells About Oakite's Great New Pre-Paint Cleaner

OAKITE Compound No. 33 is a cleaning-phosphating material that simultaneously removes oil and rust and conditions the metal surface for painting.

It also removes heat scale and other oxides, carbon smut, soldering and welding residues, identification inks and other soils from steel, cast iron, aluminum sheet and castings.

Oakite Compound No. 33 is a great soak cleaner for metal parts of moderate size; and great for hand-swabbing on large pieces like cabinets, desks, doors and truck cabs.

Oakite Compound No. 33 saves money; *frequently eliminates pickling operations on moderately rusty steel.*

FREE Write to Oakite Products, Inc., 30H Thames St., New York 6, N. Y., for your copy of Folder F7993 on *"Oakite Compound No. 33"*.

SPECIALIZED INDUSTRIAL CLEANING
OAKITE
MATERIALS • METHODS • SERVICE

Technical Service Representatives Located in Principal Cities of United States and Canada

ELECTRODES

Cents per lb, f.o.b. plant, threaded electrodes with nipples, unbozed

Diam. in in.	Length in in.	Cents Per lb
	GRAPHITE	
17, 18, 20	60, 72	17.85
8 to 16	48, 60, 72	17.85
7	48, 60	19.57
6	48, 60	20.95
4, 5	40	21.50
3	40	22.61
2½	24, 30	23.15
2	24, 30	25.36
	CARBON	
40	100, 110	8.03
35	65, 110	8.03
30	65, 84, 110	8.03
24	72 to 104	8.03
20	84, 90	8.03
17	60, 72	8.03
14	60, 72	8.57
10, 12	60	8.84
8	60	9.10

CLAD STEEL

Base prices, cents per pound, f.o.b. mill

Stainless-carbon	Plate	Sheet
No. 304, 20 pct,		
Coatesville, Pa. (21)	*29.5	
Washgtn, Pa. (39)	*29.5	
Claymont, Del. (39)	*28.00	
Conshohocken, Pa. (26)		*24.00
New Castle, Ind. (55)	*26.50	*25.50
Nickel-carbon		
10 pct. Coatesville (21)	32.5	
Inconel-carbon		
10 pct Coatesville (21)	40.5	
Monel-carbon		
10 pct Coatesville (21)	33.5	
No. 302 Stainless-copper-stainless, Carnegie, Pa. (60)		77.00
Aluminized steel sheets, hot dip, Butler, Pa. (7)		7.75

*Includes annealing and pickling, or sandblasting.

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	Base per lb
18	4	1	—	—	$1.235
18	4	1	—	5	$1.86
18	4	2	—	—	$1.38
1.5	4	1.5	8	—	78.5¢
6	4	2	6	—	.87¢

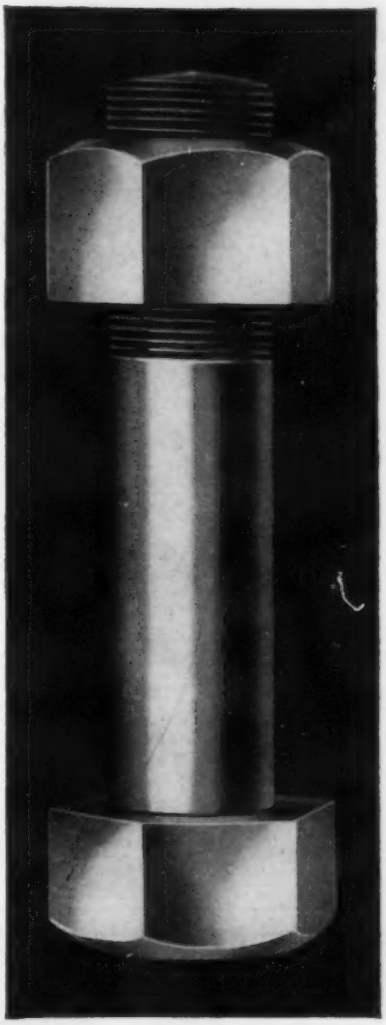
High-carbon chromium ..... 63.5¢
Oil hardened manganese ..... 35¢
Special carbon ..... 32.5¢
Extra carbon ..... 27¢
Regular carbon ..... 23¢

Warehouse prices on and east of Mississippi are 3¢ per lb higher. West of Mississippi, 5¢ higher.

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.

Swedish sponge iron c.l.f. New York, ocean bags... 7.4¢ to 9.0¢
Canadian sponge iron, del'd, in East ..... 10.00¢
Domestic sponge iron, 98+% Fe, carload lots ..... 9.0¢ to 15.0¢
Electrolytic iron, annealed, 99.5+% Fe ..... 36.0¢ to 39.5¢
Electrolytic iron unannealed, minus 325 mesh, 99+% Fe 48.5¢
Hydrogen reduced iron, minus 300 mesh, 98+% Fe 63.0¢ to 80.0¢
Carbonyl iron, size 5 to 10 micron, 98%, 99.8+% Fe 70.0¢ to $1.3[illegible]
Aluminum ..... 29.00¢
Brass, 10 ton lots ..... 30.00¢ to 33.25¢
Copper, electrolytic 10.25¢ plus metal value
Copper, reduced ... 10.00¢ plus metal value
Cadmium 100-199 lb.. 95¢ plus metal value
Chromium, electrolytic, 99% min., and quantity $3.50
Lead ..... 6.5¢ plus metal value
Manganese ..... 52.00¢
Molybdenum, 99% $2.65
Nickel, unannealed ..... 75.5¢
Nickel, annealed ..... $1.5¢
Nickel, spherical, unannealed 78.5¢
Silicon ..... 34.00¢
Solder powder.. 6.5¢ to 8.5¢ plus met. value
Stainless steel, 302 ..... 75.00¢
Tin ..... 11.00¢ plus metal value
Tungsten, 99% $4.15
Zinc, 10 ton lots ..... 20.50¢ to 23.35¢



WHEN IT'S *Special* BOLTS *and* STUDS

Send your Specifications to

ERIE

37 years' experience in making special bolts, studs, nuts for specific job requirements.

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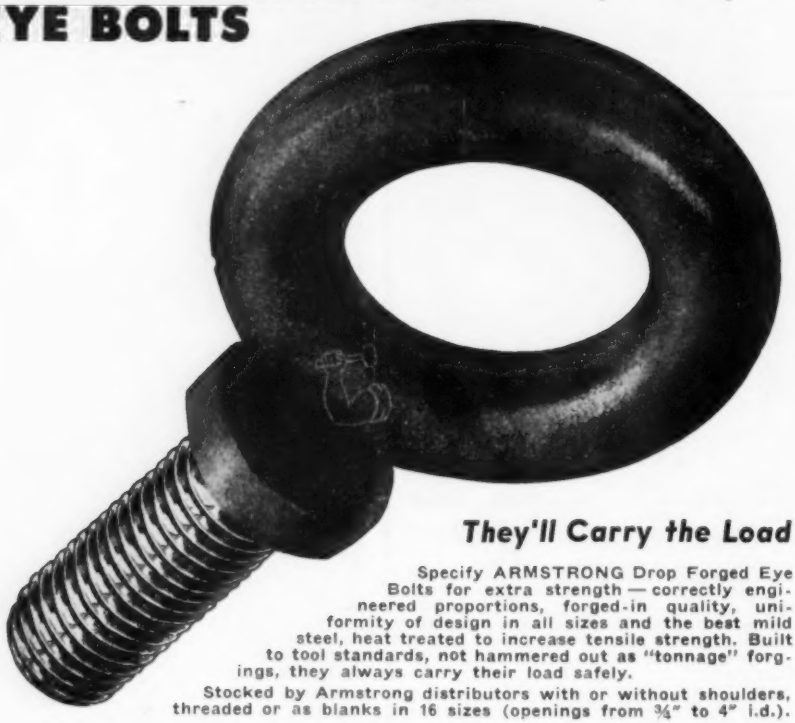
ERIE • PA.
A SUBSIDIARY OF
Barium STEEL CORPORATION
Steelmaking to the Service
STUDS • BOLTS • NUTS • ALLOYS
STAINLESS • CARBON • BRONZE

Representation in Principal Cities

ARMSTRONG *Drop Forged* EYE BOLTS



They'll Carry the Load

Specify ARMSTRONG Drop Forged Eye Bolts for extra strength — correctly engineered proportions, forged-in quality, uniformity of design in all sizes and the best mild steel, heat treated to increase tensile strength. Built to tool standards, not hammered out as "tonnage" forgings, they always carry their load safely.

Stocked by Armstrong distributors with or without shoulders, threaded or as blanks in 16 sizes (openings from ¾" to 4" i.d.).

Write for Catalog

ARMSTRONG BROS. TOOL CO.

5209 W. Armstrong Avenue **Chicago 30, U.S.A.**

Eastern Warehouse and Sales: 199 Lafayette St., New York 12, N. Y.
Pacific Coast Whse. and Sales Office: 1275 Mission St., San Francisco 3, Calif.

"HERCULES"*
RED-STRAND
the **DEPENDABLE**
WIRE ROPE
for **TOUGH JOBS**

* REG. U.S. PAT. OFF.

Experienced wire rope users have found that they can depend on "HERCULES" (Red-Strand) for the strength... toughness... durability — necessary for consistent, safe, and economical service. Our exacting standards and rigid tests insure these results.

MADE ONLY BY

We Invite Your Inquiries

A. LESCHEN & SONS ROPE CO. **5909 KENNERLY AVE. • ST. LOUIS, MO.**

ESTABLISHED 1857

New York 6 · Chicago 7 · Birmingham 6 · Houston 3 · Denver 2 · Los Angeles 21 · San Francisco 7 · Portland 9 · Seattle 4

ELECTRICAL SHEETS

22 Ga. H-R cut lengths

F.o.b. Mill Cents Per Lb.	Armature	Elec.	Motor	Dynamo	Transf. 72	Transf. 65	Transf. 58
Beech Botton-15	....	7.25	8.50	9.30	9.85	10.40	11.10
Brackenridge-28	....	7.25	8.50	9.30	9.85	....	....
Follansbee-63	6.75	7.25	8.50	9.30	9.85	10.40	11.10
Granite City-22	....	7.95	9.20	....	....	....	....
Ind. Harbor-3	6.75	7.25	....	....	....	....	....
Mansfield-75	6.75	7.25	8.50	9.30	....	....	....
Niles, O.-64	7.05	7.55	....	....	....	....	....
Vandergrift-1	6.75	7.25	8.50	9.30	9.85	10.40	11.10
Warren, O.-4	6.75	7.25	8.50	9.30	9.85	10.40	11.10
Zanesville-7	6.75	7.25	8.50	9.30	9.85	10.40	11.10

Transformer 52, 80¢ above Transformer 58.

Ferrochrome

Contract prices, cents per pound, contained Cr, lump size, bulk, in carloads, delivered. (65-72% Cr, 2% max. Si.)

0.06% C	30.50	0.20% C	29.50
0.10% C	30.00	0.50% C	29.25
0.15% C	29.75	1.00% C	29.00
3.00% C			28.75
65-69% Cr, 4-9% C			22.00
62-66% Cr, 4-6% C, 6-9% Si.			22.85

High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome price schedule. Add 5¢ for each additional 0.25% N.

Chromium Metal

Contract prices, per lb chromium contained packed, delivered, ton lots. 97% min. Cr, 1% max. Fe.

0.20% Max. C.	$1.09
0.50% max. C.	1.08
00 min. C	1.04

Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-49%, C 0.05% max.) Contract price, carloads, f.o.b. Niagara Falls, freight allowed; lump 4-in. x down, bulk 2-in. x down, 21.75¢ per lb of contained Cr plus 12.00¢ per lb of contained Si.

Bulk 1-in. x down, 21.90¢ per lb contained Cr plus 12.20¢ per lb contained Si

Calcium-Silicon

Contract price per lb of alloy, dump delivered.

30-33% Ca, 60-65% Si, 3.00% max Fe

Carloads	19.00
Ton lots	22.10
Less ton lots	23.10

Calcium-Manganese—Silicon

Contract prices, cents per lb of alloy, lump, delivered.

16-20% Ca, 14-18% Mn, 53-59% Si.

Carloads	20.00
Ton lots	22.30
Less ton lots	23.30

CMSZ

Contract price, cents per lb of alloy, delivered.

Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si, 1.25-1.75% Zr, 3.00-4.5% C.

Alloy 5: 50.56% Cr, 4-6% Mn, 13.50-16.00% Si, 0.75 to 1.25% Zr, 3.50-5.00% C

Ton lots	20.75
Less ton lots	22.00

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max St. Louis. V-5: 38-42% Cr, 17-19% Si, 8-11% Mn.

Ton lots	16.50¢
Less ton lots	17.75¢

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.

Carload packed	18.00¢
Ton lots to carload packed	19.00¢
Less ton lots	20.50¢

SMZ

Contract price, cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe, ½ in. x 12 mesh.

Ton lots	17.25
Less ton lots	18.50

FERROALLOYS

Ferromanganese
78-82% Mn. maximum contract base price, gross ton, lump size.
F.o.b. Niagara Falls, Alloy, W. Va., Welland, Ont., Ashtabula, O. $185
F.o.b. Johnstown, Pa. $187
F.o.b. Sheridan, Pa. $185
F.o.b. Etna, Clairton, Pa. $185
$2.00 for each 1% above 82% Mn, penalty, $2.15 for each 1% below 78%.
Briquets—Cents per pound of briquet, delivered, 66% contained Mn.
Carload, bulk 10.45
Ton lots 12.05

Spiegeleisen
Contract prices gross ton, lump, f.o.b.

	16-19% Mn 3% max. Si	19-21% Mn 3% max. Si
Palmerton, Pa.	$74.00	$75.00
Pgh. or Chicago	74.00	75.00

Manganese Metal
Contract basis, 2 in. x down, cents per pound of metal, delivered.
96% min. Mn, 0.2% max. C, 1% max Si, 2% max. Fe.
Carload, packed 29.7
Ton lots 31.3

Electrolytic Manganese
F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.
Carloads 2
Ton lots 3
Less ton lots 3

Medium Carbon Ferromanganese
Mn 80% to 85%, C 1.25 to 1.50. Contract price, carloads, lump, bulk, delivered, per lb. of contained Mn .....19.15¢

Low-Carbon Ferromanganese
Contract price, cents per pound Mn contained, lump size, del'd., Mn. 85-90%.

	Carloads	Ton	Less
0.07% max. C, 0.06% P, 90% Mn	26.25	28.10	29.30
0.07% max. C.....	25.75	27.60	28.80
0.15% max. C.....	25.25	27.10	28.30
0.30% max. C.....	24.75	26.60	27.80
0.50% max. C.....	24.25	26.10	27.30
0.75% max. C, 7.00% max. Si.....	21.25	23.10	24.30

Silicomanganese
Contract basis, lump size, cents per pound of metal, delivered, 65-68% Mn, 18-20% Si, 1.5% max. C. For 2% max. C, deduct 0.2¢.
Carload bulk 9.90
Ton lots 11.55
Briquet, contract basis carlots, bulk delivered, per lb of briquet 11.15
Ton lots 11.75

Silvery Iron (electric furnace)
Si 14.01 to 14.50 pct, f.o.b. Keokuk Iowa, or Wenatchee, Wash., $89.50 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls N. Y., $83.00. Add $1.00 per ton for each additional 0.50% Si up to and including 18%. Add $1.00 for each 0.50% Mn over 1%.

Silicon Metal
Contract price, cents per pound contained Si, lump size, delivered, for ton lots packed.
96% Si, 2% Fe 21.70
97% Si, 1% Fe 22.10

Silicon Briquets
Contract price, cents per pound of briquet bulk, delivered, 40% Si, 1 lb Si briquets.
Carload, bulk 6.95
Ton lots 8.55

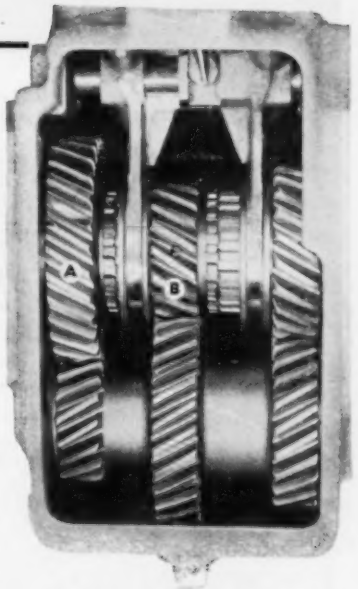
Electric Ferrosilicon
Contract price, cents per pound contained Si, lump, bulk, carloads, delivered.

25% Si.....	19.00	75% Si.....	14.30
50% Si.....	12.40	85% Si.....	15.55
90-95% Si			17.50

Calcium Metal
Eastern zone contract prices, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	$2.05	$2.95	$3.75
Less ton lots..	2.40	3.30	4.55

Gear Unit Made Better ... but Cheaper with AMGEARS know-how



Wanted . . . constant mesh 3-speed divider and multiplier transmission for 28 hp.

Supplied: Exceptionally compact unit with 2000 rpm. input, 3150 rpm. overdrive and 1060 rpm. underdrive output. Yet, no bronze bearings needed on A and B! WHY? Amgears designed the output shaft and gears A and B to rotate in same direction. Result, a relatively small difference in velocity between shaft and gear bores, with no load when velocity differences occur.

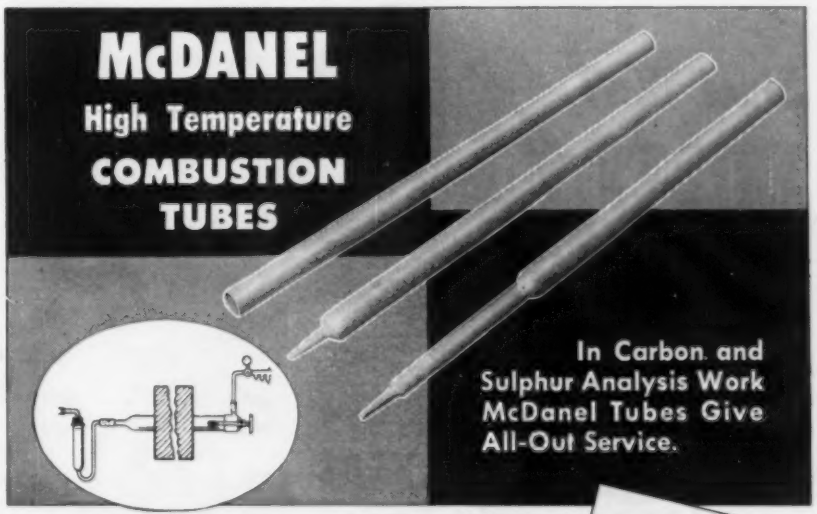
Save on *your* gear costs . . . improve your products . . . with AMGEARS design help as well as unparalleled gear manufacturing facilities. Write for interesting CASE HISTORIES.

AMGEARS, INC.
4633 West 65th Street Chicago 38, Ill.

Production and precision spurs, sprockets, helicals, worms and wormgears; straight and spiral bevel gears and racks.

AMGEARS, INC.
CHICAGO 38, ILLINOIS
A SUBSIDIARY OF HUPP CORPORATION
CONTRACT MANUFACTURERS
Detroit • Cleveland • Chicago

McDANEL
High Temperature COMBUSTION TUBES



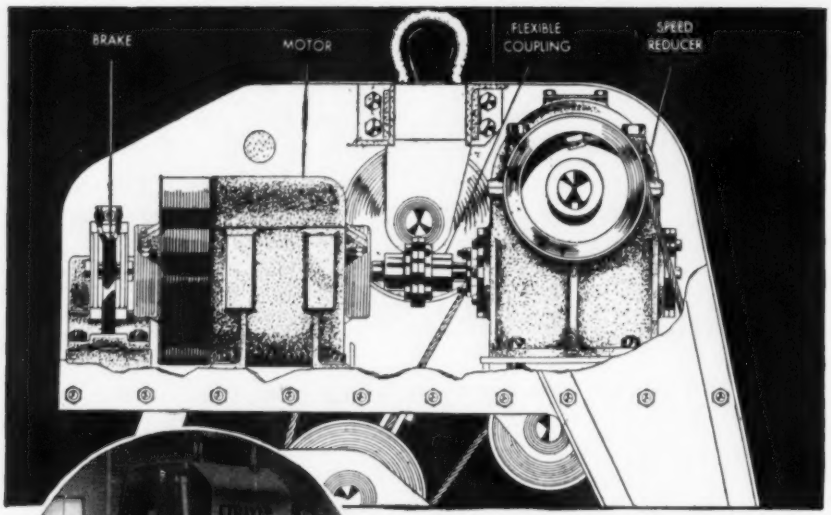
In Carbon and Sulphur Analysis Work McDanel Tubes Give All-Out Service.

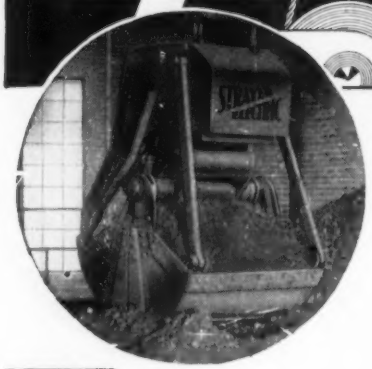
Non-porous, gas-tight and highly refractory, McDanel Tubes never spall or blister. They stand up under thermal shock and have low coefficient of expansion. 30 years of unchallenged tube leadership in serving America's metallurgical laboratories is evidence of their superior quality, economy and performance.

Write Today for 1951 Catalog "McDanel Industrial Porcelains"

Refractory Porcelain Specialties in stock or designed to meet specific needs. Flasks, retorts, crucibles, etc., and parts "custom-made" to do the job that is needed.

McDANEL REFRACTORY PORCELAIN CO.
Beaver Falls, Pa.





HOOK 'ER ON—PLUG 'ER IN

ABOVE YOU SEE WHY the Erie Electric Bucket works in its own headroom controlled from the crane cab. This sturdily constructed bucket needs only to be hooked over the crane hook and power line plugged in. The man in the cab controls the opening of the bucket from cracking the lips to any degree of opening or closing. The extra in-built weight permits easy penetration. *Write for complete particulars*

ERIE STEEL CONSTRUCTION CO
812 GEIST ROAD • ERIE PA

ERIE

BUCKETS • BINS • AGGREMETERS
ELECTRIC OVERHEAD TRAVELING CRANES
PORTABLE CONCRETE PLANTS

STEEL CONSTRUCTION CO., ERIE, PA.

Since 1887

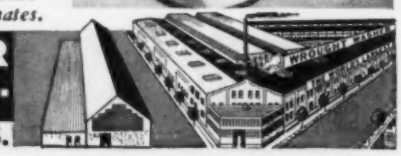
MILWAUKEE WROT WASHERS

Better

WASHERS

. . . Competitively Priced

Large volume production, the most advanced methods and facilities, plus more than 60 years of continuous experience in the manufacture of Washers, are factors that enable us to offer you top quality washers and stampings at competitive costs. Over 22,000 sets of dies for making Washers of every type (Standard and Special), from every type of material, for every purpose, in any finish. STAMPINGS of all descriptions; Blanking, Forming, Drawing. *Submit your blueprints and quantity requirements for estimates.*



WROUGHT WASHER MANUFACTURING CO.
The World's Largest Producer of Washers
2202 S. BAY ST., MILWAUKEE 7, WIS.

Other Ferroalloys

Alsifer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Suspension Bridge, N. Y.
- Carload ..... 8.15¢
- Ton lots ..... 9.55¢

Calcium molybdate, 45-40%, f.o.b. Langeloth, Pa., per pound contained Mo. $1.15

Ferrocolumbium, 50-60%, 2 in x D, contract basis, delivered, per pound contained Cb.
- Ton lots $4.90
- Less ton lots 4.95

Ferro - Tantalum - columbium, 20% Ta, 40% Cb, 0.30 C. Contract basis, delivered, ton lots, 2 in. x D, per lb of contained Cb plus Ta $3.75

Ferromolybdenum, 55-75%, f.o.b. Langeloth, Pa., per pound contained Mo $1.32

Ferrophosphorus, electrolytic, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., $3 unitage, per gross ton $65.00
- 10 tons to less carload 75.00

Ferrotitanium, 40%, regular grade, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti $1.35

Ferrotitanium, 25%, low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti $1.50
- Less ton lots $1.55

Ferrotitanium, 15 to 19%, high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload per net ton $177.00

Ferrotungsten, standard, lump or ¼ x down, packed, per pound contained W, 5 ton lots, delivered $3.25

Ferrovanadium, 35-55%, contract basis, delivered, per pound, contained V.
- Openhearth ..... $3.00-$3.05
- Crucible 3.10- 3.15

High speed steel (Primos) 3.25

Molybdic oxide, briquets or cans, per lb contained Mo, f.o.b. Langeloth, Pa. $1.14
- bags, f.o.b. Washington, Pa., Langeloth, Pa. $1.13

Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound
- Carload, bulk lump ..... 14.50¢
- Ton lots, bulk lump ..... 15.75¢
- Less ton lots, lump ..... 16.25¢

Vanadium pentoxide, 88-92% V_2O_5 contract basis, per pound contained V_2O_5 ..... $1.28

Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.
- ton lots ..... 21.00¢

Zirconium, 12-15%, contract basis, lump, delivered, per lb of alloy.
- carload, bulk ..... 7.00¢

Boron Agents

Contract prices per lb of alloy, del.

Borosil, f.o.b. Philo, Ohio, freight allowed, B 3-4%, Si 40-45%, per lb contained B $5.25

Bortam, f.o.b. Niagara Falls
- Ton lots, per pound ..... 45¢
- Less ton lots, per pound ..... 50¢

Carbortam, Ti 15-21%, B 1-2%, Si 2-4%, Al 1-2%, C 4.5-7.5%, f.o.b. Suspension Bridge, N. Y., freight allowed.
- Ton lots, per pound ..... 10.00¢

Ferroboron, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D. Ton lots $1.20
- F.o.b. Wash., Pa.; 100 lb, up
- 10 to 14% B ..... .75
- 14 to 19% B 1.20
- 19% min. B 1.50

Grainal, f.o.b. Bridgeville, Pa., freight allowed, 100 lb and over.
- No. 1 ..... $1.00
- No. 6 ..... 68¢
- No. 79 ..... 50¢

Manganese—Boron 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, delivered.
- Ton lots $1.46
- Less ton lots 1.57

Nickel—Boron 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, delivered.
- Less ton lots $1.80

Silcaz, contract basis, delivered.
- Ton lots ..... 45.00¢

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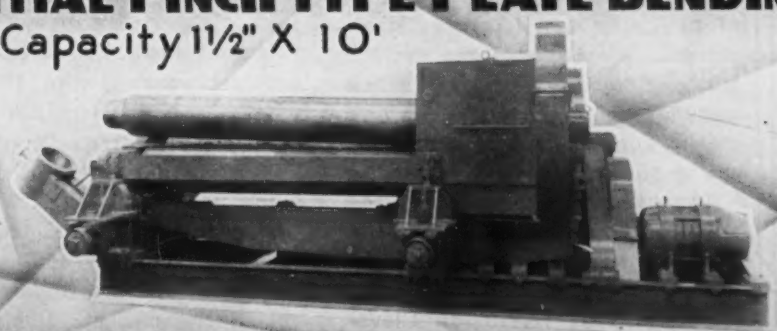

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NEWS OF USED, REBUILT AND SURPLUS MACHINERY

Price Controls—New machine tools of equal quality are more amenable to price controls than their used fellows. The government's price chill applied to used machinery of varying quality may result in a jungle of red tape. It will have, whatever its shortcomings in a difficult field, one overall result—sapping a lusty market whose prices had more spring than a jack-in-the-box.

Evaluation of condition, working order, quality of rebuilt and reconditioned machines will again have to be considered. The groundwork was laid by the old OPA.

Ripe for Controls—The nature of the used machinery market, the scramble for equipment and resultant high prices made the field ripe for price controls. Some dealers have been complaining that it was difficult to buy and sell because of market uncertainties. Some dealers feared that they were selling themselves out of business by not being able to replace many machines they were selling at prices buyers were willing to pay.

Cry in the Wilderness—As in every other industry, there have been many who oppose price control on the grounds that it interferes with basic capitalistic laws of supply, demand, and resultant prices. Their argument was weakened because too many buyers have despaired on hearing prices of used machines that rivalled those of new ones and too many dealers sold a machine for a certain sum one day and had to pay much more later to replace it. The stand of the rugged individualists is a cry in the wilderness.

The used market has exhibited unruliness and no signs of toning down. It was asking for controls.

Out of This World—In Cleveland recently used machine tool prices marched to a new high as demand for good equipment turned the market into a brawl for available machines. Particularly in demand were turret lathes, radial drills, production milling machines, and tool room and metal forming equipment of any type.

Dealers moaned that prices were "out of this world." Cited was the case of a production milling machine which sold for $2450 2 months ago and some weeks later sold for $3850. A No. 5 Warner & Swasey turret lathe in good condition brought $12,500, the price of a new machine, at a recent auction. Only 6 months ago a comparable machine sold for $6500.

Drag Out the Ancients—Cleveland demand is growing for older machines, 20 years and older, many of which reposed in the retirement of inventory for a few years. A definite market is shaping up, although buyers refused to pay inflated prices.

Now that defense production is taking form and with the Air Force planning to order a fabulous number of machine tools, more buyers will be forced to dig into this obsolete reserve. It was reported in Cleveland that two 1921 Cone machines brought an offer of $2100 each. As new machine tool buyers fall into the used machinery field under the stimulus of defense orders and extended delivery dates on new machines, they, too, may look over the venerable items.

Not at Peak Yet—Demand has not yet reached the 1942 peak when dealers sacrificed dignity and went as far as dragging machines out of scrap yards. Prices being paid at auctions were getting so high in the Chicago area that some dealers could not attend. Users were bidding them out of the market. Dealers who did attend usually were bidding for clients.